<110> Osteryoung, Katherine W.
       Vitha, Stanislav
       Koksharova, Olga A.
       Gao, Hongo

<120> Plastid Division and Related Genes and Proteins, and Methods of
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<140> 10/600,070
<141> 2003-06-20

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Glu Thr Val Leu Gln Asn Trp Leu Ala Ala Lys Ala Ala Ala Leu Gly
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Pro Gln Tyr Asp Arg Asp Arg Leu Ala Thr Val Leu Thr Gly Glu Val
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Leu Gln Thr Trp Gln Gly Phe Ser Ser Gln Gln Ala Asn Thr Gln Leu
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Thr Ser Gln Phe Asp His Lys Leu Thr Val Asp Ser Val Gln Leu Ser
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Tyr Pro Ala Thr Val Glu Ala Ile Tyr Gln Gly Arg Tyr Arg Trp Val
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Ser Ile Ala Gln Ile Leu Ala Leu Trp Gln Arg Arg Gly Gln Ile Asn
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Cys His Phe Ser Ala Asp Tyr Glu Arg Leu Leu Leu Gly Glu Val Pro
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Glu Gln Pro Asp Arg Ile Asn Val Glu Thr Arg Leu Pro Ala Ile Ala
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Met Thr Leu Pro Trp Val Pro Glu Gln Pro Gly Glu Ala Phe Val Pro
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-23-

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Pro Ala Val Leu Val Val Gly Gln Gln Thr Asp Gly Lys Ser Ala Leu
    50                  55                  60


Val Glu Ala Leu Met Gly Phe Gln Phe Asn His Val Gly Gly Gly Thr
65                  70                  75                  80


Lys Thr Arg Arg Pro Ile Thr Leu His Met Lys Tyr Asp Pro Gln Cys
                85                  90                  95


Gln Phe Pro Leu Cys His Leu Gly Ser Asp Asp Asp Pro Ser Val Ser
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Leu Pro Lys Ser Leu Ser Gln Ile His Ala Tyr Ile Glu Ala Glu Asn
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Gln Val Gln Ala Arg Ala Val Glu Ala Leu Val Arg Ala Lys Met Gln
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His Lys Glu Phe Ile Ile Leu Cys Leu Glu Asp Ser Ser Asp Trp Ser
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Ile Ala Thr Thr Arg Arg Ile Val Met Gln Val Asp Pro Glu Leu Ser
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Ser Gly Arg Val Gly Tyr Gly Gln Asp Ser Val Tyr Lys Ser Asn Asp
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Glu Phe Lys Gln Ala Val Ser Leu Arg Glu Met Glu Asp Ile Ala Ser
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Leu Glu Lys Lys Leu Gly Arg Leu Leu Thr Lys Gln Glu Lys Ser Arg
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Ile Gly Ile Ser Lys Leu Arg Leu Phe Leu Glu Glu Leu Leu Trp Lys
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Arg Tyr Lys Glu Ser Val Pro Leu Ile Ile Pro Leu Leu Gly Lys Glu
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-26-

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Pro Pro Asp Lys Phe Gly Glu Thr Leu Gln Asp Glu Arg Thr Gln Gly
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Gly Ala Phe Val Gly Thr Asp Gly Leu Gln Phe Ser His Lys Leu Ile
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Gln Asn Ala Gly Met Arg Leu Tyr Gly Gly Ala Gln Tyr His Arg Ala
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Met Ala Glu Phe Arg Phe Leu Val Gly Ala Ile Lys Cys Pro Pro Ile
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Thr Arg Glu Glu Ile Val Asn Ala Cys Gly Val Glu Asp Ile His Asp
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Gly Thr Asn Tyr Ser Arg Thr Ala Cys Val Ile Ala Val Ala Lys Ala
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Arg Glu Thr Phe Glu Pro Phe Leu His Gln Leu Gly Ala Arg Leu Leu
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His Ile Leu Lys Arg Leu Leu Pro Ile Ser Val Tyr Leu Leu Gln Lys
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Glu Gly Glu Tyr Leu Ser Gly His Glu Val Phe Leu Lys Arg Val Ala
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Ser Ala Phe Asn Ser Phe Val Glu Ser Thr Glu Lys Ser Cys Arg Asp
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Lys Cys Met Glu Asp Leu Ala Ser Thr Thr Arg Tyr Val Thr Trp Ser
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Leu His Asn Lys Asn Arg Ala Gly Leu Arg Gln Phe Leu Asp Ser Phe
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Trp Asn Arg Lys Leu Ala Pro Ser Ser Glu Arg Ile Val Tyr Ala Leu
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Val Gln Gln Ile Phe Gln Gly Ile Arg Glu Tyr Phe Leu Ala Ser Ala
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Glu Leu Lys Phe Asn Cys Phe Leu Leu Met Pro Ile Val Asp Lys Leu
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Pro Ala Leu Leu Arg Glu Glu Leu Glu Asn Ala Phe Glu Asp Asp Leu
705   710   715   720

Asp Ser Ile Phe Asp Ile Thr Asn Leu Arg Gln Ser Leu Asp Gln Lys
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Lys Arg Ser Thr Glu Ile Glu Leu Arg Arg Val Lys Arg Ile Lys Glu
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gggccacaac tgttcccttc aataacagcg ataactgatc aagaaaaata taaacaaaac    3960

aggtgagaaa acacagcact gatcaatact aacaaaggta cttcgtacgt caatcagaaa    4020

atatgacgca gcaattttaa agtcttaagg gcatccaaca caaaaagttt acagccattc    4080

tgaatttgta gcaagtccta gatatcattt actgtagcat aattttatat gtgtcagtaa    4140

tcaataaaca aatttgtttt tatgtgtcag tagttaataa accaaaaaaa aagagaagtt    4200

tacacaaatg aacttgttgt aattatacaa aaactattaa tccacgagtc caggcaaaaa    4260

tgaaaaggta tgggaaggtg taaatagaaa tctaaaaaaa cgaaatgctc tctacagtta    4320

ccttggttaa gaagagatca tggaaagtcc tgcctctctc tttgagtttt gcttcatcca    4380

aagagctgca ttgaaaggaa ttattcaacc tccaatgagt tatattttct ataaatcagt    4440

agctaacaat taaactgcct aaaatcaagt agacattttc agacaaaaca aattgcgacc    4500

taagttcctt gctcacggta tccagctttc tgactgtact gcggtactcc tttcctaaca    4560

gtggaatgat caatggaaca ctctctttgt acctggaaag agaagggcat caagactaca    4620

gcgaaaagta aactacaata gaaacagagg ctggaaaaat cagagttaaa acaacagtta    4680

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ttttcctgtt ttgtcagtaa acggcccaac ttcttctcta aagatgcaat gtcttccatt    4800

tctctaagtg acacagcctg taataaaaac cacacatagt ttagaaaaag acctgtttaa    4860

cttgtttaag gaatcagaca gcagagcaga gacctgtttg aactcgtcat tagacttata    4920

cactgaatcc tgtccatagc caactcttcc agaaggcaca gacgtgaaaa aaggagaatc    4980

gcccaataag gagctgtcaa gtgcgcttgc aggaggtgag agaaagactt ccacgtcaga    5040

tgaacatgag aattgaggga ttttagtgtc aagctttgta gaaacaacaa ttgtcctaga    5100

aagctcagga tcaacctaca tgaacgagaa acaaacttta acaaaaataa agacaaggtt    5160
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tgctccagtc actgctatct tcgaggcata aaatgatgaa ctctttgtgt tgcatctttg    5280

ctcggactag agcttccaca gcccgtgctt gaacctaaga aaaagaacaa gtaacccact    5340

ctcaaataaa gcaaaaccaa aacatgaaat cagccacgga attggctgga agccataaga    5400

aaaaacaacc tgaagagctc ggtttttcag tcctggtgca ggagcaataa gtccaggtgt    5460

atcaatgatg gtaaggtttg dacaatactt atactggact ttcacaataa tctcctttgc    5520

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actccaaatc atataacaaa tttcgttaac atgagcattt cgcttctcta caataaacct    5640

aagtacttgt gtttctcaac attcgtcaaa atcttcccag aatttatacg cagaaacaag    5700

caattgaaga agcacaagta ataataataa caaaacacct gaatttgtga gagagatttg    5760

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ctcttgtgta actatgatta aaattgaaat agtgactttt attgttacga catggaacaa    6600

atcaacgagt tctattgtta aagagagaca ttgatgaatg taacaaaact gtggcttaga    6660

agccgaaagg agacttagtt cgggtccctc cttcaccgta ttgctcgttc cattttctca    6720

attcgttcat tgtcgtcgcg tcgtatgcca ctgacggact tacctgcaaa ttacattaca    6780

atgacgcaat ttcgataatg caaacaccag gggaaaaaac atgaatagag atgatgatga    6840

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<212> DNA
<213> Arabidopsis thaliana

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gaattggaga cgccgttcga agcaccggcg gttcttgtgg tgggacagca gaccgacggt     180

aaaagtgcgc ttgtggaagc tcttatgggg tttcaattta accatgtcgg cggcggaacc     240

aagactcgtc ggccgattac tctccatatg aagtacgatc ctcagtgtca attcccgctt     300

tgtcatctcg gatctgatga tgatccttcc gtttctcttc ccaaatctct ctcacaaatt     360

caggcatata ttgaggctga gaacatgagg ctggagcaag agccatgtag cccattctct     420

gcaaaggaga ttattgtgaa agtccagtat aagtattgtc caaaccttac catcattgat     480

acacctggac ttattgctcc tgcaccagga ctgaaaaacc gagctcttca ggttcaagca     540

cgggctgtgg aagctctagt ccgagcaaag atgcaacaca aagagttcat cattttatgc     600

ctcgaagata gcagtgactg gagcattgca accactcgaa ggatagtgat gcaagttgat     660

cctgagcttt ctaggacaat tgttgtttct acaaagcttg acactaaaat ccctcaattc     720

tcatgttcat ctgacgtgga agtctttctc tcacctcctg caagcgcact tgacagctcc     780

ttattgggcg attctccttt tttcacgtct gtgccttctg aagagttgg ctatggacag     840

gattcagtgt ataagtctaa tgacgagttc aaacaggctg tgtcacttag agaaatggaa     900

gacattgcat ctttagagaa gaagttgggc cgtttactga caaaacagga aagagtagg     960

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agtgttccat tgatcattcc actgttagga aaggagtacc gcagtacagt cagaaagctg    1080

gataccttat cgctgttatt gaagggaaca gttgtggccc ctccagataa atttggtgag    1140

acactgcaag atgaaaggac acaaggagga gcatttgttg gtactgatgg tctccagttt    1200

tcacataagc taataccgaa tgcagggatg cgtctctatg ggggtgcaca atatcaccgt    1260

gccatggctg agtttcgttt tctagttggt gctatcaaat gtcccccaat aacgagggag    1320

gaaattgtaa atgcatgtgg agttgaggat attcatgatg aacaaacta ttccagaaca    1380

gcttgtgtta tagcagttgc gaaggctcgt gagacgtttg aacctttcct tcatcagaaa    1440

gttttttcca gttctcattt tcgtttgttt tgcgttgata tagttagggg cgaggcttct    1500

acacattctc aagagattgc ttccaatttc tgtatatctt cttcaggtag gtactgtttt    1560
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gcattcaaca gttttgtgga gtccacagaa aaatcatgtc gtgacaaatg tatggaggat    1680

ttagcaagta caactcgcta tgttacatgg tctcttcaca acaagaaccg agctggtcta    1740

cgtcaattct tggactcatt tggtggaaca gagcataata cgacatcagg taatgccata    1800

ggatttagtc ttccccaaga tgcattaggt ggcacaacag acaccaagtc aagatcagat    1860

gtaaagctaa gccatctcgc ctcaaacatc gattcaggtt ccagtattca gacaacagaa    1920

atgcggttgg ctgatcttct agatagcaca ctttggaacc gcaagcttgc tccttcctct    1980

gagagaattg tgtacgcatt ggtccaacag atattccagg catacgaga gtactttctc      2040

gcctctgctg agttaaagtt caactgtttt cttctaatgc ccatcgttga taagttacct    2100

gctcttctcc gggaagagtt ggaaaacgca tttgaagacg acctcgatag tatcttcgac    2160

atcacgaatc tccggcaatc acttgatcaa aagaaacgga gcacagagat cgagctcaga    2220

aggataaaga ggataaaaga gaaattcaga gtgatgaatg agaagctaaa ctctcatgaa    2280

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<213> Arabidopsis thaliana

<400> 16

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Glu Asp Asp Ala Ala Ile Glu Glu Arg Trp Ser Leu Tyr Glu Ala Tyr
                20                  25                  30


Asn Glu Leu His Ala Leu Ala Gln Glu Leu Glu Thr Pro Phe Glu Ala
            35                  40                  45


Pro Ala Val Leu Val Val Gly Gln Gln Thr Asp Gly Lys Ser Ala Leu
        50                  55                  60


Val Glu Ala Leu Met Gly Phe Gln Phe Asn His Val Gly Gly Gly Thr
65                  70                  75                  80


Lys Thr Arg Arg Pro Ile Thr Leu His Met Lys Tyr Asp Pro Gln Cys
                85                  90                  95
```

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```
Gln Phe Pro Leu Cys His Leu Gly Ser Asp Asp Asp Pro Ser Val Ser
            100             105             110

Leu Pro Lys Ser Leu Ser Gln Ile Gln Ala Tyr Ile Glu Ala Glu Asn
            115             120             125

Met Arg Leu Glu Gln Glu Pro Cys Ser Pro Phe Ser Ala Lys Glu Ile
    130             135             140

Ile Val Lys Val Gln Tyr Lys Tyr Cys Pro Asn Leu Thr Ile Ile Asp
145             150             155             160

Thr Pro Gly Leu Ile Ala Pro Ala Pro Gly Leu Lys Asn Arg Ala Leu
                165             170             175

Gln Val Gln Ala Arg Ala Val Glu Ala Leu Val Arg Ala Lys Met Gln
            180             185             190

His Lys Glu Phe Ile Ile Leu Cys Leu Glu Asp Ser Ser Asp Trp Ser
            195             200             205

Ile Ala Thr Thr Arg Arg Ile Val Met Gln Val Asp Pro Glu Leu Ser
    210             215             220

Arg Thr Ile Val Val Ser Thr Lys Leu Asp Thr Lys Ile Pro Gln Phe
225             230             235             240

Ser Cys Ser Ser Asp Val Glu Val Phe Leu Ser Pro Pro Ala Ser Ala
            245             250             255

Leu Asp Ser Ser Leu Leu Gly Asp Ser Pro Phe Phe Thr Ser Val Pro
            260             265             270

Ser Gly Arg Val Gly Tyr Gly Gln Asp Ser Val Tyr Lys Ser Asn Asp
            275             280             285

Glu Phe Lys Gln Ala Val Ser Leu Arg Glu Met Glu Asp Ile Ala Ser
    290             295             300

Leu Glu Lys Lys Leu Gly Arg Leu Leu Thr Lys Gln Glu Lys Ser Arg
305             310             315             320

Ile Gly Ile Ser Lys Leu Arg Leu Phe Leu Glu Glu Leu Leu Trp Lys
            325             330             335
```

```
Arg Tyr Lys Glu Ser Val Pro Leu Ile Ile Pro Leu Leu Gly Lys Glu
        340             345             350

Tyr Arg Ser Thr Val Arg Lys Leu Asp Thr Leu Ser Leu Leu Leu Lys
        355             360             365

Gly Thr Val Val Ala Pro Pro Asp Lys Phe Gly Glu Thr Leu Gln Asp
        370             375             380

Glu Arg Thr Gln Gly Gly Ala Phe Val Gly Thr Asp Gly Leu Gln Phe
385             390             395             400

Ser His Lys Leu Ile Pro Asn Ala Gly Met Arg Leu Tyr Gly Gly Ala
            405             410             415

Gln Tyr His Arg Ala Met Ala Glu Phe Arg Phe Leu Val Gly Ala Ile
        420             425             430

Lys Cys Pro Pro Ile Thr Arg Glu Glu Ile Val Asn Ala Cys Gly Val
        435             440             445

Glu Asp Ile His Asp Gly Thr Asn Tyr Ser Arg Thr Ala Cys Val Ile
    450             455             460

Ala Val Ala Lys Ala Arg Glu Thr Phe Glu Pro Phe Leu His Gln Lys
465             470             475             480

Val Phe Ser Ser Ser His Phe Arg Leu Phe Cys Val Asp Ile Val Arg
            485             490             495

Gly Glu Ala Ser Thr His Ser Gln Glu Ile Ala Ser Asn Phe Cys Ile
            500             505             510

Ser Ser Ser Gly Arg Tyr Cys Phe Leu Trp Phe Asp Gly Glu Tyr Leu
        515             520             525

Ser Gly His Glu Val Phe Leu Lys Arg Val Ala Ser Ala Phe Asn Ser
    530             535             540

Phe Val Glu Ser Thr Glu Lys Ser Cys Arg Asp Lys Cys Met Glu Asp
545             550             555             560
```

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Leu Ala Ser Thr Thr Arg Tyr Val Thr Trp Ser Leu His Asn Lys Asn
                565   570   575

Arg Ala Gly Leu Arg Gln Phe Leu Asp Ser Phe Gly Gly Thr Glu His
            580   585   590

Asn Thr Thr Ser Gly Asn Ala Ile Gly Phe Ser Leu Pro Gln Asp Ala
            595   600   605

Leu Gly Gly Thr Thr Asp Thr Lys Ser Arg Ser Asp Val Lys Leu Ser
    610   615   620

His Leu Ala Ser Asn Ile Asp Ser Gly Ser Ser Ile Gln Thr Thr Glu
625   630   635   640

Met Arg Leu Ala Asp Leu Leu Asp Ser Thr Leu Trp Asn Arg Lys Leu
            645   650   655

Ala Pro Ser Ser Glu Arg Ile Val Tyr Ala Leu Val Gln Gln Ile Phe
            660   665   670

Gln Gly Ile Arg Glu Tyr Phe Leu Ala Ser Ala Glu Leu Lys Phe Asn
            675   680   685

Cys Phe Leu Leu Met Pro Ile Val Asp Lys Leu Pro Ala Leu Leu Arg
    690   695   700

Glu Glu Leu Glu Asn Ala Phe Glu Asp Asp Leu Asp Ser Ile Phe Asp
705   710   715   720

Ile Thr Asn Leu Arg Gln Ser Leu Asp Gln Lys Lys Arg Ser Thr Glu
            725   730   735

Ile Glu Leu Arg Arg Ile Lys Arg Ile Lys Glu Lys Phe Arg Val Met
            740   745   750

Asn Glu Lys Leu Asn Ser His Glu Phe Ala Gln Asn Leu Lys Ala Pro
            755   760   765

Ser Val Gln His
    770

<210> 17
<211> 841
<212> PRT
<213> Arabidopsis thaliana

<400> 17

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Met Gln Glu Leu Tyr Thr Asn Arg Thr Val Leu Asn Arg Pro Arg Phe
1               5                   10                  15


Ala Val Asn Val Arg Pro Thr Arg Leu Lys Arg Asn Gln Gln Ser Gln
            20                  25                  30


Ser Lys Met Gln Ser His Ser Lys Asp Pro Ile Asn Ala Glu Ser Arg
        35                  40                  45


Ser Arg Phe Glu Ala Tyr Asn Arg Leu Gln Ala Ala Ala Val Ala Phe
        50                  55                  60


Gly Glu Lys Leu Pro Ile Pro Glu Ile Val Ala Ile Gly Gly Gln Ser
65                  70                  75                  80


Asp Gly Lys Ser Ser Leu Leu Glu Ala Leu Leu Gly Phe Arg Phe Asn
                85                  90                  95


Val Arg Glu Val Glu Met Gly Thr Arg Arg Pro Leu Ile Leu Gln Met
            100                 105                 110


Val His Asp Leu Ser Ala Leu Glu Pro Arg Cys Arg Phe Gln Ile Ser
        115                 120                 125


Arg Ile Phe Phe Val Glu Leu Ala Ile Leu Ile Thr Asp Leu Asp Glu
        130                 135                 140


Asp Ser Glu Glu Tyr Gly Ser Pro Ile Val Ser Ala Thr Ala Val Ala
145                 150                 155                 160


Asp Val Ile Arg Ser Arg Thr Glu Ala Leu Leu Lys Lys Thr Lys Thr
            165                 170                 175


Ala Val Ser Pro Lys Pro Ile Val Met Arg Ala Glu Tyr Ala His Cys
            180                 185                 190


Pro Asn Leu Thr Ile Ile Asp Thr Pro Gly Phe Val Leu Lys Ala Lys
            195                 200                 205
```

-38-

```
Lys Gly Glu Pro Glu Thr Thr Pro Asp Glu Ile Leu Ser Met Val Lys
    210             215             220

Ser Leu Ala Ser Pro Pro His Arg Ile Leu Leu Phe Leu Gln Gln Ser
225             230             235             240

Ser Val Glu Trp Cys Ser Ser Leu Trp Leu Asp Ala Val Arg Glu Ile
                245             250             255

Asp Ser Ser Phe Arg Arg Thr Ile Val Val Ser Lys Phe Asp Asn
            260             265             270

Arg Leu Lys Glu Phe Ser Asp Arg Gly Glu Val Asp Arg Tyr Leu Ser
        275             280             285

Ala Ser Gly Tyr Leu Gly Glu Asn Thr Arg Pro Tyr Phe Val Ala Leu
    290             295             300

Pro Lys Asp Arg Ser Thr Ile Ser Asn Asp Glu Phe Arg Arg Gln Ile
305             310             315             320

Ser Gln Val Asp Thr Glu Val Ile Arg His Leu Arg Glu Gly Val Lys
            325             330             335

Gly Gly Phe Asp Glu Glu Lys Phe Arg Ser Cys Ile Gly Phe Gly Ser
            340             345             350

Leu Arg Asp Phe Leu Glu Ser Glu Leu Gln Lys Arg Tyr Lys Glu Ala
        355             360             365

Ala Pro Ala Thr Leu Ala Leu Leu Glu Glu Arg Cys Ser Glu Val Thr
    370             375             380

Asp Asp Met Leu Arg Met Asp Met Lys Ile Gln Ala Thr Ser Asp Val
385             390             395             400

Ala His Leu Arg Lys Ala Ala Met Leu Tyr Thr Ala Ser Ile Ser Asn
            405             410             415

His Val Gly Ala Leu Ile Asp Gly Ala Ala Asn Pro Ala Pro Glu Gln
            420             425             430
```

```
Trp Gly Lys Thr Thr Glu Glu Glu Arg Gly Glu Ser Gly Ile Gly Ser
        435              440              445

Trp Pro Gly Val Ser Val Asp Ile Lys Pro Pro Asn Ala Val Leu Lys
        450              455              460

Leu Tyr Gly Gly Ala Ala Phe Glu Arg Val Ile His Glu Phe Arg Cys
465              470              475              480

Ala Ala Tyr Ser Ile Glu Cys Pro Pro Val Ser Arg Glu Lys Val Ala
            485              490              495

Asn Ile Leu Leu Ala His Ala Gly Arg Gly Gly Gly Arg Gly Val Thr
        500              505              510

Glu Ala Ser Ala Glu Ile Ala Arg Thr Ala Ala Arg Ser Trp Leu Ala
        515              520              525

Pro Leu Leu Asp Thr Ala Cys Asp Arg Leu Ala Phe Val Leu Gly Ser
        530              535              540

Leu Phe Glu Ile Ala Leu Glu Arg Asn Leu Asn Gln Asn Ser Glu Tyr
545              550              555              560

Glu Lys Lys Thr Glu Asn Met Asp Gly Tyr Val Gly Phe His Ala Ala
            565              570              575

Val Arg Asn Cys Tyr Ser Arg Phe Val Lys Asn Leu Ala Lys Gln Cys
            580              585              590

Lys Gln Leu Val Arg His His Leu Asp Ser Val Thr Ser Pro Tyr Ser
        595              600              605

Met Ala Cys Tyr Glu Asn Asn Tyr His Gln Gly Gly Ala Phe Gly Ala
        610              615              620

Tyr Asn Lys Phe Asn Gln Ala Ser Pro Asn Ser Phe Cys Phe Glu Leu
625              630              635              640

Ser Asp Thr Ser Arg Asp Glu Pro Met Lys Asp Gln Glu Asn Ile Pro
            645              650              655

Pro Glu Lys Asn Asn Gly Gln Glu Thr Thr Pro Gly Lys Gly Gly Glu
        660              665              670
```

```
Ser His Ile Thr Val Pro Glu Thr Pro Ser Pro Asp Gln Pro Cys Glu
        675             680             685

Ile Val Tyr Gly Leu Val Lys Lys Glu Ile Gly Asn Gly Pro Asp Gly
        690             695             700

Val Gly Ala Arg Lys Arg Met Ala Arg Met Val Gly Asn Arg Asn Ile
705             710             715                 720

Glu Pro Phe Arg Val Gln Asn Gly Gly Leu Met Phe Ala Asn Ala Asp
                725             730             735

Asn Gly Met Lys Ser Ser Ser Ala Tyr Ser Glu Ile Cys Ser Ser Ala
            740             745             750

Ala Gln His Phe Ala Arg Ile Arg Glu Val Leu Val Glu Arg Ser Val
        755             760             765

Thr Ser Thr Leu Asn Ser Gly Phe Leu Thr Pro Cys Arg Asp Arg Leu
    770             775             780

Val Val Ala Leu Gly Leu Asp Leu Phe Ala Val Asn Asp Asp Lys Phe
785             790             795                 800

Met Asp Met Phe Val Ala Pro Gly Ala Ile Val Val Leu Gln Asn Glu
            805             810             815

Arg Gln Gln Leu Gln Lys Arg Gln Lys Ile Leu Gln Ser Cys Leu Thr
            820             825             830

Glu Phe Lys Thr Val Ala Arg Ser Leu
        835             840

<210>  18
<211>  817
<212>  PRT
<213>  Arabidopsis thaliana

<400>  18

Met Ala Asn Ser Asn Thr Tyr Leu Thr Thr Pro Thr Lys Thr Pro Ser
1               5               10              15

Ser Arg Arg Asn Gln Gln Ser Gln Ser Lys Met Gln Ser His Ser Lys
            20              25              30
```

-41-

```
Asp Pro Ile Asn Ala Glu Ser Arg Ser Arg Phe Glu Ala Tyr Asn Arg
    35                  40                  45

Leu Gln Ala Ala Ala Val Ala Phe Gly Glu Lys Leu Pro Ile Pro Glu
    50                  55                  60

Ile Val Ala Ile Gly Gly Gln Ser Asp Gly Lys Ser Ser Leu Leu Glu
65                  70                  75                  80

Ala Leu Leu Gly Phe Arg Phe Asn Val Arg Glu Val Glu Met Gly Thr
            85                  90                  95

Arg Arg Pro Leu Ile Leu Gln Met Val His Asp Leu Ser Ala Leu Glu
            100                 105                 110

Pro Arg Cys Arg Phe Gln Asp Glu Asp Ser Glu Glu Tyr Gly Ser Pro
        115                 120                 125

Ile Val Ser Ala Thr Ala Val Ala Asp Val Ile Arg Ser Arg Thr Glu
    130                 135                 140

Ala Leu Leu Lys Lys Thr Lys Thr Ala Val Ser Pro Lys Pro Ile Val
145                 150                 155                 160

Met Arg Ala Glu Tyr Ala His Cys Pro Asn Leu Thr Ile Ile Asp Thr
            165                 170                 175

Pro Gly Phe Val Leu Lys Ala Lys Lys Gly Glu Pro Glu Thr Thr Pro
            180                 185                 190

Asp Glu Ile Leu Ser Met Val Lys Ser Leu Ala Ser Pro Pro His Arg
        195                 200                 205

Ile Leu Leu Phe Leu Gln Gln Ser Ser Val Glu Trp Cys Ser Ser Leu
    210                 215                 220

Trp Leu Asp Ala Val Arg Glu Ile Asp Ser Ser Phe Arg Arg Thr Ile
225                 230                 235                 240

Val Val Val Ser Lys Phe Asp Asn Arg Leu Lys Glu Phe Ser Asp Arg
            245                 250                 255
```

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```
Gly Glu Val Asp Arg Tyr Leu Ser Ala Ser Gly Tyr Leu Gly Glu Asn
            260                 265                 270

Thr Arg Pro Tyr Phe Val Ala Leu Pro Lys Asp Arg Ser Thr Ile Ser
            275                 280                 285

Asn Asp Glu Phe Arg Arg Gln Ile Ser Gln Val Asp Thr Glu Val Ile
    290                 295                 300

Arg His Leu Arg Glu Gly Val Lys Gly Gly Phe Asp Glu Glu Lys Phe
305                 310                 315                 320

Arg Ser Cys Ile Gly Phe Gly Ser Leu Arg Asp Phe Leu Glu Ser Glu
                325                 330                 335

Leu Gln Lys Arg Tyr Lys Glu Ala Ala Pro Ala Thr Leu Ala Leu Leu
            340                 345                 350

Glu Glu Arg Cys Ser Glu Val Thr Asp Asp Met Leu Arg Met Asp Met
            355                 360                 365

Lys Ile Gln Ala Thr Ser Asp Val Ala His Leu Arg Lys Ala Ala Met
    370                 375                 380

Leu Tyr Thr Ala Ser Ile Ser Asn His Val Gly Ala Leu Ile Asp Gly
385                 390                 395                 400

Ala Ala Asn Pro Ala Pro Glu Gln Trp Gly Lys Thr Thr Glu Glu Glu
                405                 410                 415

Arg Gly Glu Ser Gly Ile Gly Ser Trp Pro Gly Val Ser Val Asp Ile
            420                 425                 430

Lys Pro Pro Asn Ala Val Leu Lys Leu Tyr Gly Gly Ala Ala Phe Glu
            435                 440                 445

Arg Val Ile His Glu Phe Arg Cys Ala Ala Tyr Ser Ile Glu Cys Pro
    450                 455                 460

Pro Val Ser Arg Glu Lys Val Ala Asn Ile Leu Leu Ala His Ala Gly
465                 470                 475                 480

Arg Gly Gly Gly Arg Gly Val Thr Glu Ala Ser Ala Glu Ile Ala Arg
                485                 490                 495
```

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```
Thr Ala Ala Arg Ser Trp Leu Ala Pro Leu Leu Asp Thr Ala Cys Asp
         500             505             510

Arg Leu Ala Phe Val Leu Gly Ser Leu Phe Glu Ile Ala Leu Glu Arg
         515             520             525

Asn Leu Asn Gln Asn Ser Glu Tyr Glu Lys Lys Thr Glu Asn Met Asp
         530             535             540

Gly Tyr Val Gly Phe His Ala Ala Val Arg Asn Cys Tyr Ser Arg Phe
545             550             555             560

Val Lys Asn Leu Ala Lys Gln Cys Lys Gln Leu Val Arg His His Leu
             565             570             575

Asp Ser Val Thr Ser Pro Tyr Ser Met Ala Cys Tyr Glu Asn Asn Tyr
             580             585             590

His Gln Gly Gly Ala Phe Gly Ala Tyr Asn Lys Phe Asn Gln Ala Ser
         595             600             605

Pro Asn Ser Phe Cys Phe Glu Leu Ser Asp Thr Ser Arg Asp Glu Pro
         610             615             620

Met Lys Asp Gln Glu Asn Ile Pro Pro Glu Lys Asn Asn Gly Gln Glu
625             630             635             640

Thr Thr Pro Gly Lys Gly Gly Glu Ser His Ile Thr Val Pro Glu Thr
             645             650             655

Pro Ser Pro Asp Gln Pro Cys Glu Ile Val Tyr Gly Leu Val Lys Lys
             660             665             670

Glu Ile Gly Asn Gly Pro Asp Gly Val Gly Ala Arg Lys Arg Met Ala
         675             680             685

Arg Met Val Gly Asn Arg Asn Ile Glu Pro Phe Arg Val Gln Asn Gly
         690             695             700

Gly Leu Met Phe Ala Asn Ala Asp Asn Gly Met Lys Ser Ser Ser Ala
705             710             715             720
```

Tyr Ser Glu Ile Cys Ser Ser Ala Ala Gln His Phe Ala Arg Ile Arg
                725   730   735

Glu Val Leu Val Glu Arg Ser Val Thr Ser Thr Leu Asn Ser Gly Phe
            740   745   750

Leu Thr Pro Cys Arg Asp Arg Leu Val Val Ala Leu Gly Leu Asp Leu
        755   760   765

Phe Ala Val Asn Asp Asp Lys Phe Met Asp Met Phe Val Ala Pro Gly
    770   775   780

Ala Ile Val Val Leu Gln Asn Glu Arg Gln Gln Leu Gln Lys Arg Gln
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Asn Ile Ser His Glu Ser Ala Asp Gln Thr Ser Ser Ser Arg Pro Arg
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Thr Leu Tyr Pro Gly Gly Tyr Lys Arg Pro Glu Leu Ala Val Pro Gly
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Ser Asn Pro Asp Ser Val Leu Leu Pro Leu Val Ala Arg Ile Val Lys
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Met Asn Glu Leu Pro Glu Lys Lys Asn Ser Ala Gly Phe Ile Lys Leu
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Glu Asn Val Ile Leu Tyr Pro Val Ser Ala Arg Ser Ala Leu Glu Ala
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Lys Leu Ser Thr Ala Ser Leu Val Gly Arg Asp Asp Leu Glu Ile Ala
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Asp Pro Gly Ser Asn Trp Arg Val Gln Ser Phe Asn Glu Leu Glu Lys
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Phe Leu Tyr Ser Phe Leu Asp Ser Ser Thr Ala Thr Gly Met Glu Arg
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Ser Ser Val Glu Ala Leu Val Arg Gln Asp Cys Leu Ala Ala Arg Glu
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<400> 23

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<213> Arabidopsis thaliana

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Leu Ser Leu Ser Leu Ser Met Arg Thr Leu Ile Ser His Arg Gln Cys
        35                  40                  45


Val Thr Ser Pro Phe Leu Ile Ser Ala Ala Ser Pro Pro Phe Pro Gly
    50                  55                  60


Arg Cys Phe Lys Leu Ser Ser Phe Thr Pro Pro Arg His Arg Arg Phe
65                  70                  75                  80


Ser Ser Leu Ser Ile Arg Asn Ile Ser His Glu Ser Ala Asp Gln Thr
                85                  90                  95
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Ser Ser Ser Arg Pro Arg Thr Leu Tyr Pro Gly Gly Tyr Lys Arg Pro
            100   105   110

Glu Leu Ala Val Pro Gly Leu Leu Leu Arg Leu Asp Ala Asp Glu Val
            115   120   125

Met Ser Gly Asn Arg Glu Glu Thr Leu Asp Leu Val Asp Arg Ala Leu
    130   135   140

Ala Lys Ser Val Gln Ile Val Val Ile Asp Gly Gly Ala Thr Ala Gly
145   150   155   160

Lys Leu Tyr Glu Ala Ala Cys Leu Leu Lys Ser Leu Val Lys Gly Arg
            165   170   175

Ala Tyr Leu Leu Ile Ala Glu Arg Val Asp Ile Ala Ser Ala Val Gly
            180   185   190

Ala Ser Gly Val Ala Leu Ser Asp Glu Gly Leu Pro Ala Ile Val Ala
            195   200   205

Arg Asn Thr Leu Met Gly Ser Asn Pro Asp Ser Val Leu Leu Pro Leu
    210   215   220

Val Ala Arg Ile Val Lys Asp Val Asp Ser Ala Leu Ile Ala Ser Ser
225   230   235   240

Ser Glu Gly Ala Asp Phe Leu Ile Leu Gly Ser Gly Glu Glu Asp Thr
            245   250   255

Gln Val Ala Asp Ser Leu Leu Lys Ser Val Lys Ile Pro Ile Tyr Val
            260   265   270

Thr Cys Arg Gly Asn Glu Glu Ala Lys Glu Glu Leu Gln Leu Leu Lys
    275   280   285

Ser Gly Val Ser Gly Phe Val Ile Ser Leu Lys Asp Leu Arg Ser Ser
    290   295   300

Arg Asp Val Ala Leu Arg Gln Ser Leu Asp Gly Ala Tyr Val Val Asn
305   310   315   320

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Asn His Glu Thr Gln Asn Met Asn Glu Leu Pro Glu Lys Lys Asn Ser
             325             330             335

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             340             345             350

Glu Lys Ser Val Leu Arg Glu Thr Ile Glu Ile Ile His Lys Ala Ala
             355             360             365

Pro Leu Met Glu Glu Val Ser Leu Leu Ile Asp Ala Val Ser Arg Ile
    370             375             380

Asp Glu Pro Phe Leu Met Val Ile Val Gly Glu Phe Asn Ser Gly Lys
385             390             395             400

Ser Thr Val Ile Asn Ala Leu Leu Gly Lys Arg Tyr Leu Lys Glu Gly
             405             410             415

Val Val Pro Thr Thr Asn Glu Ile Thr Phe Leu Cys Tyr Ser Asp Leu
             420             425             430

Glu Ser Glu Glu Gln Gln Arg Cys Gln Thr His Pro Asp Gly Gln Tyr
             435             440             445

Ile Asn Ile Val Asp Thr Pro Gly Thr Asn Val Ile Leu Gln Arg Gln
    450             455             460

Gln Arg Leu Thr Glu Glu Phe Val Pro Arg Ala Asp Leu Leu Val Phe
465             470             475             480

Val Leu Ser Ala Asp Arg Pro Leu Thr Glu Ser Glu Val Glu Val Thr
             485             490             495

Val Leu Leu Gly Met Glu Gly Lys Val Val Thr Arg Leu Asn Ala Tyr
             500             505             510

Ile Lys Val Ala Phe Leu Arg Tyr Thr Gln Gln Trp Lys Lys Lys Phe
             515             520             525

Val Phe Ile Leu Asn Lys Ser Asp Ile Tyr Arg Asp Ala Arg Glu Leu
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Glu Glu Ala Ile Ser Phe Val Lys Glu Asn Thr Arg Lys Leu Leu Asn
545             550             555             560
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Thr Glu Asn Val Ile Leu Tyr Pro Val Ser Ala Arg Ser Ala Leu Glu
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Ala Asp Pro Gly Ser Asn Trp Arg Val Gln Ser Phe Asn Glu Leu Glu
            595             600             605

Lys Phe Leu Tyr Ser Phe Leu Asp Ser Ser Thr Ala Thr Gly Met Glu
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Arg Ile Arg Leu Lys Leu Glu Thr Pro Met Ala Ile Ala Glu Arg Leu
625                 630             635                 640

Leu Ser Ser Val Glu Ala Leu Val Arg Gln Asp Cys Leu Ala Ala Arg
            645             650             655

Glu Asp Leu Ala Ser Ala Asp Lys Ile Ile Ser Arg Thr Lys Glu Tyr
            660             665             670

Ala Leu Lys Met Glu Tyr Glu Ser Ile Ser Trp Arg Arg Gln Ala Leu
            675             680             685

Ser Leu Ile Asp Asn Ala Arg Leu Gln Val Val Asp Leu Ile Gly Thr
            690             695             700

Thr Leu Arg Leu Ser Ser Leu Asp Leu Ala Ile Ser Tyr Val Phe Lys
705                 710             715                 720

Gly Glu Lys Ser Ala Ser Val Ala Ala Thr Ser Lys Val Gln Gly Glu
            725             730             735

Ile Leu Ala Pro Ala Leu Thr Asn Ala Lys Glu Leu Leu Gly Lys Tyr
            740             745             750

Ala Glu Trp Leu Gln Ser Asn Thr Ala Arg Glu Gly Ser Leu Ser Leu
            755             760             765

Lys Ser Phe Glu Asn Lys Trp Pro Thr Tyr Val Asn Ser Lys Thr Gln
            770             775             780
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Leu Gly Ile Asp Thr Tyr Asp Leu Leu Gln Lys Thr Asp Lys Val Ser
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caatcgctgt gtttccgtgt gttttccccc tttttggttt tagatttgcc taaaccaatc   180

agaacaagag aaacctggaa acaagaacca aaaaaagtgg gctttctctg catcatcatt   240

ccacttctgg tccccaactg aaaaggacaa tccaaagcta gatcccttca aattttcctt   300

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caatcgctgt gtttccgtgt gttttccccc tttttggttt tagatttgcc taaaccaatc      240

agaacaagag aaacctggaa acaagaacca aaaaaagtgg gctttctctg catcatcatt      300

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tgactttgtt tagaaaactt aggaggacca tatggcaagc ttttatacag tgttagactt      660

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-62-

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-63-

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gcgaaacatc atagtcatag gcgacgaaag aagatattga gaagcactaa aggacaagtg    2580

actagaagca tgcccattgt atctcaagct atctagtgct ggcaaaagtg tgtaactaaa    2640

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cttttatatt gtttaaattt cttgtaaaat ttaatttata attttttaaa cttttttaaag   5940

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cattgtacac atattatttc ttcataggtt gaataatata tgtccgttta aaaaactttg    6300

aattacatca tattcagaaa aaaatataat attttattaa ctatatatat tttatataaa    6360

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<213>   Arabidopsis thaliana

<400>   28

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Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His
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<220>
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<400> 51
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<210> 52
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<220>
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<400> 52
gattaatgag actatatatg agag   24

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<400>   54
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gctctgatgg tgattctggt aac                                               23


<210>   56
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<400>   56
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<210>   57
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<400>  58
gctacagttc tcaaccggta aatc                                         24


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<400>  59
cataagcttt tatgctccaa aatagtctc                                    29


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<400>  60
cttgatcttg tgttctgaca tctc                                         24


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<400>  61
ctaaactatt cacaaatgcc atagacg                                      27


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<220>
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<400> 62
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<400> 63
gcacaaacaa acagggtcaa tagtta   26

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cattgttaga aagtcaacac tttg   24

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<400>  68
ctccaacttc aagcaaaacg gatg                                              24


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<400> 77
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<400> 79
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<400> 85
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<211> 61
<212> PRT
<213> Arabidopsis thaliana

<400> 86

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Val Lys Lys Ala Phe Arg Gln Leu Ala Lys Lys Tyr His Pro Asp Val
            20   25   30

Cys Arg Gly Ser Asn Cys Gly Val Gln Phe Gln Thr Ile Asn Glu Ala
            35   40   45

Tyr Asp Ile Val Leu Lys Gln Ile Lys Asn Gln Met Glu
    50   55   60

<210> 87
<211> 68
<212> PRT
<213> Phaseolus vulgaris

<400> 87

Ser Leu Tyr Asp Ile Leu Gly Ile Pro Ala Gly Ala Ser Ser Gln Glu
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Ile Lys Ala Ala Tyr Arg Arg Leu Ala Arg Val Cys His Pro Asp Val
            20   25   30

Ala Ala Ile Asp Arg Lys Asn Ser Ser Ala Asp Glu Phe Met Lys Ile
            35   40   45

His Ala Ala Tyr Ser Thr Leu Ser Asp Pro Asp Lys Arg Ala Asn Tyr
    50   55   60

Asp Arg Ser Leu
65

<210> 88
<211> 68
<212> PRT
<213> Arabidopsis thaliana

-80-

<400> 88

Ser Leu Tyr Glu Ile Leu Glu Ile Pro Val Gly Ser Thr Ser Gln Glu
1   5   10   15

Ile Lys Ser Ala Tyr Arg Arg Leu Ala Arg Ile Cys His Pro Asp Val
            20   25   30

Ala Arg Asn Ser Arg Asp Asn Ser Ser Ala Asp Asp Phe Met Lys Ile
        35   40   45

His Ala Ala Tyr Cys Thr Leu Ser Asp Pro Glu Lys Arg Ala Val Tyr
    50   55   60

Asp Arg Arg Thr
65

<210> 89
<211> 63
<212> PRT
<213> Mycoplasma pneumoniae

<400> 89

Thr Leu Tyr Asp Leu Leu Glu Leu Pro Gln Thr Ala Thr Leu Gln Glu
1   5   10   15

Ile Lys Thr Ala Tyr Lys Arg Leu Ala Lys Arg Tyr His Pro Asp Ile
            20   25   30

Asn Lys Gln Gly Ala Asp Thr Phe Val Lys Ile Asn Asn Ala Tyr Ala
        35   40   45

Val Leu Ser Asp Thr Thr Gln Lys Ala Glu Tyr Asp Ala Met Leu
    50   55   60

<210> 90
<211> 63
<212> PRT
<213> Mycoplasma genitalium

<400> 90

Asn Leu Tyr Asp Leu Leu Glu Leu Pro Thr Thr Ala Ser Ile Lys Glu
1   5   10   15

Ile Lys Ile Ala Tyr Lys Arg Leu Ala Lys Arg Tyr His Pro Asp Val
            20   25   30

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Asn Lys Leu Gly Ser Gln Thr Phe Val Glu Ile Asn Asn Ala Tyr Ser
         35   40   45

Ile Leu Ser Asp Pro Asn Gln Lys Glu Lys Tyr Asp Ser Met Leu
         50   55   60

<210> 91
<211> 68
<212> PRT
<213> Arabidopsis thaliana

<400> 91

Ser Phe Tyr Asp Leu Leu Gly Val Thr Glu Ser Val Thr Leu Pro Glu
1   5   10   15

Ile Lys Gln Ala Tyr Lys Gln Leu Ala Arg Lys Tyr His Pro Asp Val
         20   25   30

Ser Pro Pro Asp Arg Val Glu Glu Tyr Thr Asp Arg Phe Ile Arg Val
         35   40   45

Gln Glu Ala Tyr Glu Thr Leu Ser Asp Pro Arg Arg Arg Val Leu Tyr
         50   55   60

Asp Arg Asp Leu
65

<210> 92
<211> 69
<212> PRT
<213> Drosophila melanogaster

<400> 92

Asn Cys Tyr Asp Val Leu Gly Val Thr Arg Glu Ser Ser Lys Ser Glu
1   5   10   15

Ile Gly Lys Ala Tyr Arg Gln Leu Ala Arg Arg Tyr His Pro Asp Leu
         20   25   30

His Arg Gly Ala Glu Ala Lys Ala Ala Ala Glu Thr Gln Phe Lys Leu
        35   40   45

Val Ala Thr Ala Tyr Glu Ile Leu Arg Asp Glu Glu Ser Arg Thr Asp
    50   55   60

Tyr Asp Tyr Met Leu
65

<210> 93
<211> 70
<212> PRT
<213> Caenorhabditis elegans

<400> 93

Asn Cys Tyr Asp Val Leu Glu Val Asn Arg Glu Glu Phe Asp Lys Gln
1   5   10   15

Lys Leu Ala Lys Ala Tyr Arg Ala Leu Ala Arg Lys His His Pro Asp
            20   25   30

Arg Val Lys Asn Lys Glu Glu Lys Leu Leu Ala Glu Glu Arg Phe Arg
            35   40   45

Val Ile Ala Thr Ala Tyr Glu Thr Leu Lys Asp Asp Glu Ala Lys Thr
    50   55   60

Asn Tyr Asp Tyr Tyr Leu
65   70

<210> 94
<211> 72
<212> PRT
<213> Arabidopsis thaliana

<400> 94

Ser Pro Tyr Asp Thr Leu Glu Leu Asp Arg Asn Ala Glu Glu Glu Gln
1   5   10   15

Ile Lys Val Ala Tyr Arg Arg Leu Ala Lys Phe Tyr His Pro Asp Val
            20   25   30

Tyr Asp Gly Lys Gly Thr Leu Glu Glu Gly Glu Thr Ala Glu Ala Arg
            35   40   45

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Phe Ile Lys Ile Gln Ala Ala Tyr Glu Leu Leu Met Asp Ser Glu Lys
    50   55   60

Lys Val Gln Tyr Asp Met Asp Asn
65   70

<210>   95
<211>   68
<212>   PRT
<213>   Schizosaccharomyces pombe

<400>   95

Lys Leu Tyr Asp Ile Leu Glu Val His Phe Glu Ala Ser Ala Glu Glu
1   5   10   15

Ile Lys Lys Ser Tyr Lys Arg Leu Ala Leu Leu His His Pro Asp Lys
            20   25   30

Ala Pro Ile His Glu Lys Glu Glu Ala Ala Glu Arg Phe Arg Gly Val
        35   40   45

Gln Glu Ala Tyr Asp Ile Leu Lys Asp Pro Glu Ser Arg Glu Met Tyr
        50   55   60

Asp Met Tyr Gly
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<210>   96
<211>   66
<212>   PRT
<213>   Unknown

<220>
<223>   Synthetic

<400>   96

Asp Phe Tyr Lys Ile Leu Gly Ala Glu Pro His Phe Leu Gly Asp Gly
1   5   10   15

Ile Arg Arg Ala Phe Glu Ser Arg Ile Ala Lys Pro Pro Gln Tyr Gly
            20   25   30

```
Tyr Ser Thr Glu Ala Leu Ala Gly Arg Arg Gln Met Leu Gln Ile Ala
        35              40              45

His Asp Thr Leu Thr Asn Gln Ser Ser Arg Thr Glu Tyr Asp Arg Ala
        50              55              60

Leu Ser
65


<210>   97
<211>   66
<212>   PRT
<213>   Oryza sativa

<400>   97

Asp Phe Tyr Lys Val Leu Gly Ala Glu Pro His Phe Leu Gly Asp Gly
1               5               10              15


Ile Arg Arg Ala Phe Glu Ala Arg Ile Ala Lys Pro Pro Gln Tyr Gly
        20              25              30


Tyr Ser Thr Asp Ala Leu Val Gly Arg Arg Gln Met Leu Gln Ile Ala
        35              40              45


His Asp Thr Leu Met Asn Gln Asn Ser Arg Thr Gln Tyr Asp Arg Ala
        50              55              60


Leu Ser
65


<210>   98
<211>   66
<212>   PRT
<213>   Solanum tuberosum

<400>   98

Asp Phe Tyr Arg Val Leu Gly Ala Glu Ala His Phe Leu Gly Asp Gly
1               5               10              15


Ile Arg Arg Cys Tyr Asp Ala Arg Ile Thr Lys Pro Pro Gln Tyr Gly
        20              25              30


Tyr Ser Gln Glu Ala Leu Ile Gly Arg Arg Gln Ile Leu Gln Ala Ala
        35              40              45
```

```
Cys Glu Thr Leu Ala Asp Ser Thr Ser Arg Arg Glu Tyr Asn Gln Gly
    50                  55                  60

Leu Ala
65


<210>   99
<211>   66
<212>   PRT
<213>   Artificial Sequence

<220>
<223>   Synthetic

<400>   99

Asp Leu Tyr Lys Ile Leu Gly Ala Glu Thr His Phe Leu Gly Asp Gly
1               5               10                  15


Ile Arg Arg Ala Tyr Glu Ala Lys Phe Ser Lys Pro Pro Gln Tyr Ala
            20              25                  30


Phe Ser Asn Glu Ala Leu Ile Ser Arg Arg Gln Ile Leu Gln Ala Ala
        35                  40                  45


Cys Glu Thr Leu Ala Asp Pro Ala Ser Arg Arg Glu Tyr Asn Gln Ser
    50                  55                  60


Leu Val
65


<210>   100
<211>   66
<212>   PRT
<213>   Arabidopsis thaliana

<400>   100

Asp Phe Tyr Gln Val Leu Gly Ala Gln Thr His Phe Leu Thr Asp Gly
1               5               10                  15


Ile Arg Arg Ala Phe Glu Ala Arg Val Ser Lys Pro Pro Gln Phe Gly
            20              25                  30


Phe Ser Asp Asp Ala Leu Ile Ser Arg Arg Gln Ile Leu Gln Ala Ala
        35                  40                  45
```

Cys Glu Thr Leu Ser Asn Pro Arg Ser Arg Arg Glu Tyr Asn Glu Gly
    50   55   60

Leu Leu
65

<210>   101
<211>   66
<212>   PRT
<213>   Protochlorococcus marinus MED4

<400>   101

Asp His Phe Arg Leu Ile Gly Val Ser Pro Ser Ala Thr Ser Glu Glu
1   5   10   15

Ile Leu Arg Ala Phe Gln Leu Arg Leu Asp Lys Thr Pro Asp Glu Gly
            20   25   30

Phe Thr Tyr Glu Val Leu Thr Gln Arg Ser Glu Leu Leu Arg Leu Thr
            35   40   45

Ala Asp Leu Leu Thr Asp Pro Asp Ser Arg Arg Asp Tyr Glu Asn Leu
    50   55   60

Leu Leu
65

<210>   102
<211>   66
<212>   PRT
<213>   Protochlorococcus marinus MT9313

<400>   102

Asp His Phe Arg Leu Leu Gly Val Ser Pro Ser Ala Asp Ser Glu Ala
1   5   10   15

Ile Leu Arg Ala Leu Glu Leu Arg Leu Asp Arg Cys Pro Asp Gln Gly
            20   25   30

Phe Thr His Glu Val Leu Ile Gln Arg Ala Glu Leu Leu Arg Leu Ser
        35   40   45

Ala Asp Leu Leu Thr Asp Pro Pro Arg Arg Gln Ala Tyr Glu Thr Ala
    50   55   60

Leu Leu
65

<210>   103
<211>   66
<212>   PRT
<213>   Synechocystis PCC6803

<400>   103

Asp His Phe Arg Leu Leu Gly Val Ser Pro Ser Ala Asp Pro Ala Ser
1   5   10   15

Ile Leu Arg Arg Leu Gln Thr Arg Ser Asp Ser Pro Pro Asp Asp Gly
            20   25   30

Phe Thr His Glu Gly Leu Leu Gln Arg Gln Ala Leu Leu His Arg Ser
        35   40   45

Ala Asp Leu Leu Thr Asp Pro Ser Glu Arg Ala Asp Tyr Glu Ala Ala
    50   55   60

Leu Leu
65

<210>   104
<211>   66
<212>   PRT
<213>   Synechocystis PCC6803

<400>   104

Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln Ser Gly Gly Glu Thr
1   5   10   15

Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln Leu Pro Arg Arg Glu
            20   25   30

Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln Leu Leu Ala Ile Ala
        35   40   45

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Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln Ala Tyr Asp Gln Glu
    50   55   60

Trp Trp
65

<210>   105
<211>   66
<212>   PRT
<213>   Nostoc punctiforme

<400>   105

Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Glu Glu Gln
1   5   10   15

Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu
            20   25   30

Tyr Ser Gln Ala Ala Ile Ser Ser Arg Lys Gln Leu Ile Glu Glu Ala
        35   40   45

Tyr Val Val Leu Ser Asp Pro Lys Gln Arg Ser Thr Tyr Asp Gln Leu
    50   55   60

Tyr Leu
65

<210>   106
<211>   66
<212>   PRT
<213>   Anabaena PCC7120

<400>   106

Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln
1   5   10   15

Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu
            20   25   30

Tyr Ser Gln Ala Ala Ile Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala
        35   40   45

.

Tyr Val Val Leu Ser Asp Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu
    50   55   60

Tyr Leu
65

<210> 107
<211> 66
<212> PRT
<213> Bombyx mori

<400> 107

Asp Tyr Tyr Ala Leu Leu Gly Cys Asp Glu Asn Ser Thr Val Glu Gln
1   5   10   15

Ile Thr Ala Glu Tyr Lys Ile Leu Ala Leu Gln His His Pro Asp Lys
            20   25   30

Asn Asp Gly Glu Lys Glu Ala Glu Met Lys Phe Gln Lys Leu Lys Glu
            35   40   45

Ala Lys Glu Ile Leu Cys Asp Pro Ser Lys Arg Ala Leu Tyr Asp Lys
    50   55   60

Trp Arg
65

<210> 108
<211> 66
<212> PRT
<213> Drosophila melanogaster

<400> 108

Asp Phe Tyr Gly Leu Leu His Cys Asp Glu Asn Ser Ser Pro Glu Gln
1   5   10   15

Ile Gln Ala Glu Tyr Lys Val Leu Ala Leu Gln Tyr His Pro Asp Lys
            20   25   30

Asn Ser Gly Asp Lys Glu Ala Glu Ala Lys Phe Gln Gln Leu Lys Glu
            35   40   45

```
Ala Lys Glu Thr Leu Cys Asp Pro Glu Lys Arg Ala Ile Tyr Asp Lys
    50                  55                  60

Trp Arg
65


<210>   109
<211>   66
<212>   PRT
<213>   Mus musculus

<400>   109

Asp Tyr Tyr Ala Leu Leu Gly Cys Asp Glu Leu Ser Ser Val Glu Gln
1               5                   10                  15


Ile Leu Ala Glu Phe Lys Ile Arg Ala Leu Glu Cys His Pro Asp Lys
            20                  25                  30


His Pro Glu Asn Ser Lys Ala Val Glu Thr Phe Gln Lys Leu Gln Lys
            35                  40                  45


Ala Lys Glu Ile Leu Cys Asn Ala Glu Ser Arg Ala Arg Tyr Asp His
    50                  55                  60


Trp Arg
65


<210>   110
<211>   65
<212>   PRT
<213>   Saccharomyces cerevisiae

<400>   110

Asp Ala Tyr Ser Ile Leu Gly Val Pro Pro Asp Ser Ser Gln Glu Gln
1               5                   10                  15


Ile Arg Lys His Tyr Lys Lys Ile Ala Val Leu Val His Pro Asp Lys
            20                  25                  30


Asn Lys Gln Ala Gly Ala Glu Glu Ala Phe Lys Val Leu Gln Arg Ala
            35                  40                  45
```

Phe Glu Leu Ile Gly Glu Pro Glu Asn Arg Leu Ile Tyr Asp Gln Ser
    50   55   60

Ile
65

<210> 111
<211> 64
<212> PRT
<213> Leishmania major

<400> 111

Glu Leu Tyr Gln Val Leu Glu Leu Asp Ala Gln Cys Thr Thr Ala Glu
1   5   10   15

Ile Ser Gln Gln Tyr Arg Arg Leu Ala Leu Arg Tyr His Pro Asp Arg
            20   25   30

Asn Ala Gly Ala Thr Val Glu Gln Phe Gln Arg Ile Glu Glu Ala His
        35   40   45

Arg Val Leu Ser Asp Leu Arg Gln Arg Gln Leu Tyr Asp Thr Val Gly
    50   55   60

<210> 112
<211> 67
<212> PRT
<213> Schizosaccharomyces pombe

<400> 112

Asp Tyr Tyr Thr Ile Leu Gly Ala Glu Ser Thr Ser Ser Tyr Val Glu
1   5   10   15

Ile Arg Gln Gln Tyr Leu Lys Leu Val Leu Arg Tyr His Pro Asp Arg
            20   25   30

Asn Pro Gly Arg Glu Ala Glu Val Leu Pro Gln Phe Gln Leu Ile Gln
        35   40   45

Lys Ala His Glu Val Leu Lys Asp Pro Lys Leu Arg Glu Leu Phe Asp
    50   55   60

Gln Arg Arg
65

<210> 113
<211> 67
<212> PRT
<213> Schizosaccharomyces pombe

<400> 113

Asp Tyr Tyr Ala Ile Leu Lys Leu Gln Lys Asn Ala Thr Phe Gln Gln
1   5   10   15

Ile Arg Lys Gln Tyr Leu Phe Leu Ala Leu Gln Tyr His Pro Asp Arg
                20   25   30

Asn Pro Gly Asp Glu Glu Arg Ala Val Lys Arg Phe Gln Arg Leu Gln
                35   40   45

Leu Ala His Glu Val Leu Ser Asp Ala Thr Lys Arg Leu Ile Tyr Asp
        50   55   60

Gln Leu Phe
65

<210> 114
<211> 68
<212> PRT
<213> Schizosaccharomyces pombe

<400> 114

Asn His Tyr Ser Val Leu Asn Leu Lys Asp Gly Lys Thr Tyr Thr Asp
1   5   10   15

Asp Glu Ile Lys Glu Ala Tyr Arg Lys Ala Leu Leu Leu Phe His Pro
                20   25   30

Asp Lys Cys Lys Glu Lys Pro Ser Val Val Tyr Thr Ile Asp Gln Val
                35   40   45

Lys Glu Ala Tyr Gln Val Leu Ser Ser Glu Lys Asp Arg Gln Gln Tyr
        50   55   60

Gln Ile Lys Gln
65

<210> 115
<211> 652
<212> PRT
<213> Anabaena PCC7120

<400> 115

Gln Gly Lys Tyr Ala Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu
1   5   10   15

Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln Leu Arg Gln Ala Tyr Ser
              20   25   30

Asp Arg Ile Val Gln Leu Pro Arg Arg Glu Tyr Ser Gln Ala Ala Ile
         35   40   45

Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala Tyr Val Val Leu Ser Asp
     50   55   60

Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu Tyr Leu Ala His Ala Tyr
65   70   75   80

Asp Pro Asp Asn Ala Ala Thr Thr Lys Val Ala Val Glu Asn Arg Gly
              85   90   95

Asp Ser Asn Asn Gly His Phe Asp Val Gln Ser Leu Ser Ile Glu Val
              100   105   110

Ser Ser Glu Glu Leu Ile Gly Ala Leu Leu Ile Leu Gln Glu Leu Gly
         115   120   125

Glu Tyr Glu Leu Val Leu Lys Leu Gly Arg Asn Tyr Leu Gly Asn Gln
     130   135   140

Asn Gly Thr Ala Ser Thr Arg Asn Gly Asn His Arg Thr Pro Glu Glu
145   150   155   160

Phe Leu Asp Ser Ser Glu Arg Pro Asp Ile Leu Leu Thr Val Ala Leu
              165   170   175

Ala Ser Leu Glu Leu Gly Arg Glu Gln Trp Gln Gln Gly His Tyr Glu
              180   185   190

Asn Ala Ala Leu Ser Leu Glu Thr Gly Gln Glu Val Leu Phe Ser Glu
              195   200   205

```
Gly Ile Phe Pro Ser Val Gln Ala Glu Ile Gln Ala Asp Leu Tyr Lys
    210             215             220

Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala Leu Pro Gln Glu Lys
225             230             235             240

Thr Ile Glu Arg His Gln Gly Leu Asp Leu Leu Gln Ser Ile Leu Asp
            245             250             255

Asp Arg Gly Gly Ile Asp Gly Thr Gly Asn Asp Gln Ser Gly Leu Asn
            260             265             270

Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln Leu Arg His His Leu Thr
        275             280             285

Val Ala Glu Gln His Lys Leu Phe Asp Gly Glu Ser Lys Arg Pro Ser
    290             295             300

Ala Val Ala Thr Tyr Leu Ala Val Tyr Ala Ser Ile Ala Arg Gly Phe
305             310             315             320

Thr Gln Arg Gln Pro Ala Leu Ile Arg His Ala Lys Gln Ile Leu Met
            325             330             335

Arg Leu Ser Lys Arg Gln Asp Val His Leu Glu Gln Ser Leu Cys Ala
            340             345             350

Leu Leu Leu Gly Gln Thr Glu Glu Ala Thr Arg Val Leu Glu Leu Ser
        355             360             365

Gln Glu Tyr Glu Ala Leu Ala Leu Ile Arg Glu Lys Ser Gln Asp Ser
    370             375             380

Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr Ala Glu Gln Trp Leu Gln
385             390             395             400

Asn Glu Val Phe Pro His Phe Arg Asp Leu Ser Arg Gln Gln Ala Ser
            405             410             415

Leu Lys Asp Tyr Phe Ala Asn Gln Gln Val Gln Ala Tyr Leu Glu Ala
            420             425             430
```

```
Leu Pro Asn Asp Ala Glu Thr Thr Asn Glu Trp Ala Val Ile Asn Arg
        435             440             445

Gln Ser Phe Ser Gln Pro Arg Gly Asn Ser Tyr Ser Gly Gly Thr Pro
        450             455             460

Val Ala Lys Arg Pro Val Gly Lys Ala Asn Arg Pro Gly Glu Ala Ser
465             470             475             480

Thr Arg Pro Val Pro Gln Arg Ser His Pro Ser Glu Val Asn Arg Gln
                485             490             495

Phe His Gln Asn Arg Thr Pro Asp Pro Glu Leu Pro Glu Thr Ser Asn
            500             505             510

His Arg Arg Pro Glu Ser Ser Asn Phe Thr Thr Ala Arg Glu Asn Ile
        515             520             525

Ser Thr Thr Asp Ala Tyr Thr Asp Asn Tyr Pro Pro Glu Ile Pro Val
    530             535             540

Glu Arg Ala Ser Arg Pro Val Gln Pro Gly Val Ser Gly Tyr Thr Gln
545             550             555             560

Ser Thr Pro Pro Arg Gln Thr Pro Lys Arg Arg Arg Arg Lys Lys Pro
            565             570             575

Gln Ala Val Val Asn Arg Gly His Ser Ile His Gln Gln Arg Gln Pro
            580             585             590

Ser Pro Ser Thr Leu Gly Arg Lys Thr Arg Leu Leu Trp Ile Val Leu
        595             600             605

Gly Ser Leu Gly Gly Ile Leu Leu Phe Trp Leu Ile Val Ser Thr Thr
        610             615             620

Phe Gly Trp Leu Lys Asn Val Phe Phe Pro Ala Pro Ser Leu Gln Gly
625             630             635             640

Glu Gln Leu Ser Ile Gln Ile Ser Gln Pro Pro Leu
            645             650
```

<210> 116
<211> 624

<212> PRT
<213> Nostoc punctiforme

<400> 116

Met Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala
1   5   10   15

Ala Ser Glu Glu Gln Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln
                20   25   30

Leu Pro Arg Arg Glu Tyr Ser Gln Ala Ala Ile Ser Ser Arg Lys Gln
            35   40   45

Leu Ile Glu Glu Ala Tyr Val Val Leu Ser Asp Pro Lys Gln Arg Ser
        50   55   60

Thr Tyr Asp Gln Leu Tyr Leu Ala His Ala Tyr Asp Pro Asp Asn Leu
65   70   75   80

Ala Ala Ala Ala Val Ala Gln Glu Asn Arg Thr Glu Ser Thr Lys Arg
                85   90   95

Gly Ser Asp Thr Gln Ser Leu Gly Ile Glu Ile Thr Gln Asp Glu Leu
            100   105   110

Val Gly Ala Leu Leu Ile Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val
            115   120   125

Leu Lys Leu Gly Arg Pro Tyr Leu Val Asn Lys Asn Ser Ala Thr Ser
    130   135   140

Ser Arg Lys Ser Asn Asn Leu Ala Asp Glu Glu Ile Tyr Glu Ser Ala
145   150   155   160

Glu His Pro Asp Val Val Leu Thr Val Ala Leu Ala Cys Leu Glu Leu
                165   170   175

Gly Arg Glu Gln Trp Gln Gln Gly His Tyr Glu Asn Ala Ala Ile Ser
            180   185   190

Leu Glu Thr Gly Gln Glu Leu Leu Val Arg Glu Gly Leu Phe Ser Ser
            195   200   205

```
Ile Gln Ala Glu Ile Gln Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg
    210             215             220

Ile Leu Glu Leu Leu Ala Leu Pro Gln Glu Lys Thr Ala Glu Arg Ser
225             230             235                 240

Gln Gly Leu Glu Leu Leu Gln Asn Leu Leu Glu Asp Arg Gly Gly Ile
            245             250                 255

Asp Gly Thr Asn Asn Asp Glu Ser Gly Leu Asn Ile Asp Asp Phe Leu
            260             265             270

Arg Phe Ile Gln Gln Leu Arg Asn His Leu Thr Val Ala Glu Gln His
        275             280             285

Lys Leu Phe Glu Ala Gln Ser Lys Arg Ser Ser Ala Val Ala Thr Tyr
    290             295             300

Leu Ala Val Tyr Ala Leu Ile Ala Arg Gly Phe Ala Gln Arg Gln Pro
305             310             315                 320

Ala Leu Ile Arg Gln Ala Arg Gln Met Leu Val Arg Leu Gly Lys Arg
            325             330             335

Gln Asp Val His Leu Glu Gln Ser Leu Cys Ala Leu Leu Leu Gly Gln
            340             345             350

Thr Glu Glu Ala Thr Arg Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala
        355             360             365

Leu Ala Phe Ile Arg Glu Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro
    370             375             380

Gly Leu Cys Leu Tyr Ala Glu Gln Trp Leu Gln His Glu Val Phe Pro
385             390             395                 400

His Phe Arg Asp Leu Ala Asn Gln Gln Ala Phe Leu Lys Asp Tyr Phe
            405             410             415

Ala Asn Gln Gln Val Gln Ala Tyr Leu Glu Ala Leu Pro Thr Asp Ala
            420             425             430

Gln Thr Thr Asn Glu Trp Ala Val Ile Asn Pro Gln Tyr Phe Pro Gln
    435             440             445
```

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```
Ala Lys Ala Lys Asn Thr His Phe His Asn Asn Ser Thr Lys Thr Ser
    450             455             460

Ala Ser Phe Asn His Ser Arg Val Pro Asn Pro Asp Leu Pro Glu Thr
465             470             475             480

Pro Thr Lys Glu Thr Ser Glu Tyr Pro Asn Phe Ser Pro Pro Met Trp
            485             490             495

Ser Ser Ser Gly Ser Ile Lys Ser Glu Val Pro Ala Ala Glu Arg Met
            500             505             510

Ser Arg Gly Thr Asn Gln His Leu Asn Gly Ser Ala Lys Ser Ala Ala
            515             520             525

Ser Gly His Asn Gln Lys Arg Arg Arg Lys Pro Thr Pro Ser Ala
    530             535             540

Ser Arg Glu Arg Ile Pro Asp Asn Arg Pro His Ser Arg Arg Pro Arg
545             550             555             560

Arg Arg Arg Thr Phe Ala Asn Thr Ile Glu Gly Lys Thr Arg Leu Val
            565             570             575

Trp Arg Val Phe Ile Ser Leu Val Ser Ile Leu Val Phe Trp Val Leu
            580             585             590

Ala Thr Thr Thr Phe Gly Trp Leu Lys Asn Leu Phe Phe Pro Gln Pro
    595             600             605

Ser Pro Pro Asp Leu Gln Leu Phe Val Gln Ile Asn Gln Pro Pro Leu
    610             615             620

<210>   117
<211>   557
<212>   PRT
<213>   Protochlorococcus marinus MED4

<400>   117

Met Glu Leu Pro Leu Asp His Phe Arg Leu Ile Gly Val Ser Pro Ser
1               5               10              15

Ala Thr Ser Glu Glu Ile Leu Arg Ala Phe Gln Leu Arg Leu Asp Lys
            20              25              30
```

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```
Thr Pro Asp Glu Gly Phe Thr Tyr Glu Val Leu Thr Gln Arg Ser Glu
    35              40                  45

Leu Leu Arg Leu Thr Ala Asp Leu Leu Thr Asp Pro Asp Ser Arg Arg
    50              55                  60

Asp Tyr Glu Asn Leu Leu Leu Asn Gly Ala Ser Gly Leu Asp Leu Ser
65              70                  75                  80

Ser Asn Arg Glu Val Ala Gly Leu Ile Leu Leu Trp Glu Ser Gly Ser
                85                  90                  95

Ser Lys Glu Ala Phe Lys Ile Thr Arg Lys Ala Leu Gln Pro Pro Gln
            100                 105                 110

Thr Pro Ala Leu Gly Ser Ser Arg Glu Ala Asp Leu Thr Leu Leu Ala
            115                 120                 125

Ala Leu Thr Ser Arg Asp Ala Ala Ile Gln Glu Gln Asp Gln Arg Ser
    130                 135                 140

Tyr Ser Asn Ala Ala Asp Phe Leu Gln Glu Gly Ile Gln Leu Leu Gln
145                 150                 155                 160

Arg Met Gly Lys Leu Gly Glu Leu Arg Lys Thr Leu Glu Glu Asp Leu
                165                 170                 175

Val Ser Leu Leu Pro Tyr Arg Ile Leu Asp Leu Leu Ser Arg Asp Leu
                180                 185                 190

Asn Asp Tyr Asp Ser His Lys Lys Gly Leu Ser Met Leu Glu Asn Leu
            195                 200                 205

Ile Ile Lys Arg Gly Gly Leu Glu Gly Lys Asn Lys Ser Glu Tyr Asn
    210                 215                 220

Asp Phe Leu Asn Gln Gln Glu Phe Glu Ser Phe Phe Gln Gln Ile Lys
225                 230                 235                 240

Pro Phe Leu Thr Val Gln Asp Gln Ile Asp Leu Phe Leu Glu Leu Gln
            245                 250                 255
```

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```
Lys Arg Gly Ser Ser Glu Ala Gly Phe Leu Ala Phe Leu Ser Leu Thr
        260             265             270

Ala Ile Gly Phe Ala Arg Arg Lys Pro Ala Lys Leu Phe Glu Ala Arg
        275             280             285

Lys Ile Leu Lys Lys Leu Asn Leu Ser Gly Leu Asp Ser Met Pro Leu
    290             295             300

Ile Gly Cys Leu Asp Leu Leu Leu Ala Asp Val Glu Gln Ser Ser Ala
305             310             315             320

Arg Phe Leu Ser Ser Ser Asp Glu Lys Leu Arg Asp Trp Leu Asn Asn
            325             330             335

Tyr Pro Gly Glu Lys Leu Glu Ala Ile Cys Ile Phe Cys Lys Asn Trp
        340             345             350

Leu Glu Asn Asp Val Leu Val Gly Tyr Arg Asp Ile Asp Leu Lys Glu
        355             360             365

Ile Asp Leu Asp Ser Trp Phe Glu Asp Arg Glu Ile Gln Glu Phe Ile
        370             375             380

Glu Gln Ile Glu Lys Lys Ser Asn Arg Thr Val Phe Lys Ser Gly Pro
385             390             395             400

Gln Asn Lys Pro Ile Phe Gln Ala Gln Glu Ser Leu Lys Asp Ser Ser
            405             410             415

Thr Gly Pro Asp Leu Asn Ser Asp Asn Phe Glu Glu Gly Arg Leu Pro
        420             425             430

Leu Pro Gly Gly Val Arg Glu Asp Gly Gln Glu Val Ile Glu Glu Asn
        435             440             445

Ile Tyr Thr Asp Glu Ile Ile Lys Asn Lys Ser Ile Glu Phe Tyr Lys
    450             455             460

Tyr Ala Ile Glu Lys Ile Ala Glu Leu Lys Phe Val Phe Gly Glu Ala
465             470             475             480

Leu Glu Asn Tyr Arg Ile Phe Asn Lys Ser Ser Tyr Leu Thr Tyr Leu
            485             490             495
```

Tyr Ala Phe Leu Ile Leu Phe Ala Phe Gly Leu Gly Val Gly Phe Val
            500   505   510

Arg Asn Asn Leu Lys Lys Pro Val Gln Glu Lys Glu Ile Ile Asp Asn
            515   520   525

Ser Leu Ser Ile Asn Glu Asn Lys Asn Val Phe Tyr Glu Gly Leu Asn
            530   535   540

Gln Asp Asp Lys Lys Lys Val Leu Asp Asn Ser Lys Ile
545   550   555

<210> 118
<211> 524
<212> PRT
<213> Protochlorococcus marinus MT9313

<400> 118

Met Ala Ala Gln Leu Val Asp Leu Pro Ile Asp His Phe Arg Leu Leu
1   5   10   15

Gly Val Ser Pro Ser Ala Asp Ser Glu Ala Ile Leu Arg Ala Leu Glu
            20   25   30

Leu Arg Leu Asp Arg Cys Pro Asp Gln Gly Phe Thr His Glu Val Leu
            35   40   45

Ile Gln Arg Ala Glu Leu Leu Arg Leu Ser Ala Asp Leu Leu Thr Asp
            50   55   60

Pro Pro Arg Arg Gln Ala Tyr Glu Thr Ala Leu Leu Glu Leu Ser Arg
65   70   75   80

Asp His Pro Gly Glu Thr Ala Gly Leu Asp Val Ser Pro Ser Arg Glu
                85   90   95

Val Ala Gly Leu Ile Leu Leu Phe Glu Ala Asn Ser Ser His Glu Val
            100   105   110

Phe His Leu Ala Ser Gln Gly Leu Gln Pro Pro Gln Ser Pro Thr Leu
            115   120   125

Gly Ser Glu Arg Glu Ala Asp Leu Ala Leu Leu Leu Ala Leu Ala Cys
            130   135   140

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```
Arg Ala Ala Ala Ala Glu Glu Gln Glu Gln Arg Arg Tyr Glu Ala Ala
145             150             155             160

Ala Ser Leu Leu His Asp Gly Ile Gln Leu Leu Gln Arg Met Gly Lys
            165             170             175

Leu Ser Glu Glu Cys His Lys Leu Glu Asn Asp Leu Asp Ala Leu Leu
        180             185             190

Pro Tyr Arg Ile Leu Asp Leu Leu Ser Arg Asp Leu Gly Asp Gln Val
        195             200             205

Ser His Gln Glu Gly Leu Arg Leu Leu Asp Asn Phe Val Ser Gln Arg
    210             215             220

Gly Gly Leu Glu Gly Thr Ala Pro Ser Pro Ala Pro Gly Gly Leu Asp
225             230             235             240

Gln Ser Glu Phe Asp Asn Phe Phe Lys Gln Ile Arg Lys Phe Leu Thr
            245             250             255

Val Gln Glu Gln Val Asp Leu Phe Leu Arg Trp Gln Gln Ala Gly Ser
        260             265             270

Ala Asp Ala Gly Phe Leu Gly Gly Leu Ala Leu Ala Ala Val Gly Phe
        275             280             285

Ser Arg Arg Lys Pro Glu Arg Val Gln Glu Ala Arg Gln His Leu Glu
    290             295             300

Arg Leu Gln Leu Asp Gly Cys Asp Pro Leu Pro Met Leu Gly Cys Leu
305             310             315             320

Asp Leu Leu Leu Gly Asp Val Gly Arg Ala Gln Glu Arg Phe Leu Arg
            325             330             335

Ser Thr Asp Pro Arg Val Lys Asp Cys Leu Asn Ser His Pro Gly Asp
            340             345             350

Glu Leu Ala Ala Phe Cys Glu Tyr Cys Arg Ser Trp Leu Arg Gly Asp
    355             360             365
```

```
Val Leu Pro Gly Tyr Arg Asp Val Asp Ala Glu Ala Val Asp Leu Glu
    370             375             380
```

```
Ala Trp Phe Ala Asp Arg Asp Val Gln Ala Tyr Val Glu Arg Leu Glu
385             390             395                     400
```

```
Arg Ser Glu Asn Arg Ala Ser Ser Leu Gly Lys Ala Phe Ser Gly Ser
                405             410             415
```

```
Ser Val Lys Gln Pro Phe Pro Trp Ala Pro Leu Asp Pro Asp Gly Ile
            420             425             430
```

```
Leu Pro Leu Ser Leu Gly Gly Pro Asp Val Gly Gln Pro Ala Ala Asp
        435             440             445
```

```
Gln Ser Ser Asp Glu Phe Ala Ser Asp Gly Met Ala Trp Ile Asp Arg
        450             455             460
```

```
Leu Ala Asp Leu Pro Arg Pro Thr Arg Pro Val Leu Ile Gly Ser Val
465             470             475                     480
```

```
Val Phe Ala Ala Leu Ile Ala Ala Phe Ala Gly Phe Ser Leu Phe Gly
            485             490                     495
```

```
Gln Arg Pro Arg Thr Ser Val Ser Thr Ala Ala Asp Gln Pro Gln Val
            500             505 ·             510
```

```
Thr Ala Pro Pro Thr Ala Thr Leu Gln Glu Glu Val
        515             520
```

```
<210>  119
<211>  566
<212>  PRT
<213>  Synechocystis PCC6803

<400>  119
```

```
Met Phe Ile Pro Leu Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln
1           5               10              15
```

```
Ser Gly Gly Glu Thr Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln
            20              25              30
```

```
Leu Pro Arg Arg Glu Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln
        35              40                      45
```

```
Leu Leu Ala Ile Ala Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln
    50              55              60

Ala Tyr Asp Gln Glu Trp Trp Gly Ala Met Asp Glu Ala Leu Gly Glu
65              70              75              80

Ala Leu Pro Leu Thr Thr Pro Glu Leu Glu Cys Ser Pro Glu Gln Glu
            85              90              95

Ile Gly Ala Leu Leu Ile Leu Leu Asp Leu Gly Glu Tyr Glu Leu Val
            100             105             110

Val Lys Tyr Gly Glu Pro Val Leu His Asp Pro Asn Pro Pro Ala Gly
        115             120             125

Gly Leu Pro Gln Asp Tyr Leu Leu Ser Val Ile Leu Ala His Trp Glu
    130             135             140

Leu Ser Arg Glu Arg Trp Gln Gln Gln Gln Tyr Glu Phe Ala Ala Thr
145             150             155             160

Ala Ser Leu Lys Ala Leu Ala Arg Leu Gln Gln Asp Asn Asp Phe Pro
            165             170             175

Ala Leu Glu Ala Glu Ile Arg Gln Glu Leu Tyr Arg Leu Arg Pro Tyr
            180             185             190

Arg Ile Leu Glu Leu Leu Ala Lys Glu Gly Gln Gly Glu Glu Gln Arg
        195             200             205

Gln Gln Gly Leu Ala Leu Leu Gln Ala Met Val Gln Asp Arg Gly Gly
    210             215             220

Ile Glu Gly Lys Gly Glu Asp Tyr Ser Gly Leu Gly Asn Asp Asp Phe
225             230             235             240

Leu Lys Phe Ile His Gln Leu Arg Cys His Leu Thr Val Ala Glu Gln
            245             250             255

Asn Ala Leu Phe Leu Pro Glu Ser Gln Arg Pro Ser Leu Val Ala Ser
            260             265             270

Tyr Leu Ala Val His Ser Leu Met Ala Glu Gly Val Lys Glu Gln Asp
    275             280             285
```

```
Pro Met Ala Ile Val Glu Ala Lys Ser Leu Ile Ile Gln Leu Glu Asn
    290                 295                 300

Cys Gln Asp Leu Ala Leu Glu Lys Val Ile Cys Glu Leu Leu Leu Gly
305                 310                 315                 320

Gln Thr Glu Val Val Leu Ala Ala Ile Asp Gln Gly Asp Pro Lys Ile
                325                 330                 335

Val Ala Gly Leu Glu Ser Lys Leu Ala Thr Gly Glu Asp Pro Leu Thr
                340                 345                 350

Ala Phe Tyr Thr Phe Thr Glu Gln Trp Leu Glu Glu Glu Ile Val Pro
        355                 360                 365

Tyr Phe Arg Asp Leu Ser Pro Glu Thr Leu Ser Pro Lys Ala Tyr Phe
    370                 375                 380

Asn Asn Pro Ser Val Gln Gln Tyr Leu Glu Gln Leu Glu Pro Asp Ser
385                 390                 395                 400

Phe Thr Thr Asp Asn Ser Phe Ala Ser Pro Ala Leu Leu Ser Thr Ala
            405                 410                 415

Thr Glu Ser Glu Thr Pro Met Val His Ser Ser Ala Ala Leu Pro Asp
            420                 425                 430

Arg Pro Leu Thr Ser Thr Val Pro Ser Arg Arg Gly Arg Ser Pro Arg
    435                 440                 445

Arg Ser Arg Asp Asp Val Phe Pro Ser Ala Asp Asn Ser Ser Gly Leu
    450                 455                 460

Ala Val Thr Thr Leu Ser Pro Ala Ile Ala Tyr Asp Thr His Ser Leu
465                 470                 475                 480

Gly Thr Asn Gly Ile Gly Gly Asp Ser Thr Ser Asn Gly Phe Ser Ser
            485                 490                 495

Asn Ser Ala Pro Glu Ser Thr Ser Lys His Lys Ser Pro Arg Arg Arg
            500                 505                 510
```

Lys Lys Arg Val Thr Ile Lys Pro Val Arg Phe Gly Ile Phe Leu Leu
        515   520   525

Cys Leu Ala Gly Ile Val Gly Gly Ala Thr Ala Leu Ile Ile Asn Arg
        530   535   540

Thr Gly Asp Pro Leu Gly Gly Leu Leu Glu Asp Pro Leu Asp Val Phe
545   550   555   560

Leu Asp Gln Pro Ser Glu
                    565

<210> 120
<211> 573
<212> PRT
<213> Synechococcus PCC7002

<400> 120

Thr Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Cys Val Pro Ala
1   5   10   15

Lys Ala Thr Thr Ala Gln Ile Thr Gln Ala Tyr Arg Asp Arg Leu Ser
        20   25   30

Gln Phe Pro Arg Arg Glu His Asn Ala Leu Ala Ile Glu Ala Arg Asn
        35   40   45

Arg Ile Ile Glu Gln Ala Phe Glu Val Leu Ser Gln Thr Glu Thr Arg
    50   55   60

Ala Val Tyr Asp His Glu Leu Ser Gly Asn Met Phe Arg Ser Leu Val
65   70   75   80

Pro Ser Arg Pro Lys Leu Pro Phe Pro Asp Arg Pro Ser Ser Asp Thr
            85   90   95

Glu Leu Glu Ala Leu Thr Ala His Gln Pro Thr Ile Asp Ile Ala Glu
            100   105   110

Lys Asp Leu Leu Gly Gly Leu Leu Leu Leu Leu Asp Leu Gly Glu Tyr
        115   120   125

Glu Leu Val Leu Lys Trp Ala Ala Pro Tyr Leu Lys Gly Lys Gly Lys
    130   135   140

Leu Val Lys Glu Gly Lys Phe Gly Ala Val Glu Ile Val Glu Gln Glu
145   150   155   160

Leu Arg Leu Cys Leu Ala Leu Ala His Trp Glu Leu Ser Arg Glu Gln
                165   170   175

Trp Leu Gln Gln His Tyr Glu Gln Ala Ala Leu Ser Gly Gln Lys Ser
            180   185   190

Gln Glu Leu Leu Val Asp Val Ala Gln Phe Ala Asp Leu Gln Gln Glu
            195   200   205

Ile Gln Gly Asp Leu Asn Arg Leu Arg Pro Tyr Gln Val Leu Glu Leu
    210   215   220

Leu Ala Leu Pro Glu Ser Glu Thr Gln Glu Arg Gln Arg Gly Leu Gln
225   230   235   240

Leu Leu Gln Glu Met Leu Ser Ala Arg Val Gly Ile Asp Gly Gln Gly
            245   250   255

Asp Asp Gln Ser Gly Leu Ser Ile Asp Asp Phe Leu Arg Phe Ile Gln
            260   265   270

Gln Leu Arg Ser Tyr Leu Thr Val Gln Glu Gln Leu Asp Leu Phe Val
            275   280   285

Ala Glu Ser Lys Arg Pro Ser Ala Ala Ala Tyr Leu Ala Val Tyr
    290   295   300

Ala Leu Leu Ala Ala Gly Phe Ser Gln Arg Lys Pro Asp Leu Val Val
305   310   315   320

Gln Ala Gln Thr Leu Leu Lys Arg Leu Gly Lys Arg Gln Asp Val Phe
            325   330   335

Leu Glu Gln Ser Ile Cys Ala Leu Leu Leu Gly Gln Pro Ser Glu Ala
            340   345   350

Asn Gln Leu Leu Glu Gln Ser Gln Glu Gln Glu Ala Ile Ala Tyr Ile
        355   360   365

Gln Glu Gln Ser Glu Gly Ala Pro Asp Leu Leu Pro Gly Leu Cys Leu
    370   375   380

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```
Tyr Gly Glu Gln Trp Leu Lys Thr Glu Val Phe Ser His Phe Arg Asp
385           390           395               400

Leu Arg Gln Arg Leu Glu Asp Gly Ser Val Ser Leu Thr Ala Tyr Phe
             405           410               415

Ala Asp Pro Glu Val Gln Gln Tyr Leu Asp Asp Leu Leu Thr Glu Ala
         420           425               430

Val Pro Thr Pro Thr Pro His Pro Asp Thr Glu Ser Thr Ala Ala Pro
         435           440               445

Ser Glu Lys Pro Pro Glu Thr Leu Gln Ser Glu Thr Gly Val Ser Pro
         450           455               460

His Pro Ser Arg Pro Ala Lys Val Asp Ser Phe Glu Asp Leu Val Thr
465           470               475               480

Gln Thr Pro Ala Thr Val Pro Pro Ala Pro Pro Ser Pro Gly Val Ala
             485           490               495

Pro Val Thr Ala Ala Leu Asn Pro Asp Pro Glu Ala Ser Ser Ala Ser
             500           505               510

Ser Lys Ser Val Ser Ser Lys Lys Ser Ile Gly Pro Trp Gly Ala Ile
         515           520               525

Ala Ala Ile Val Gly Ser Val Leu Leu Val Val Gly Leu Val Arg Ile
         530           535               540

Leu Ser Gly Leu Thr Thr Gln Glu Pro Leu Gln Val Thr Leu Asn Gly
545           550               555               560

Glu Pro Pro Leu Thr Ile Pro Ser Leu Asp Thr Ala Glu
             565           570
```

<210> 121
<211> 515
<212> PRT
<213> Synechococcus WH8102

<400> 121

Gly Asp Leu Trp Thr Leu Asp Leu Pro Ile Asp His Phe Arg Leu Leu
1   5   10   15

Gly Val Ser Pro Ser Ala Asp Pro Ala Ser Ile Leu Arg Arg Leu Gln
                20   25   30

Thr Arg Ser Asp Ser Pro Pro Asp Asp Gly Phe Thr His Glu Gly Leu
            35   40   45

Leu Gln Arg Gln Ala Leu Leu His Arg Ser Ala Asp Leu Leu Thr Asp
        50   55   60

Pro Ser Glu Arg Ala Asp Tyr Glu Ala Ala Leu Leu Ser Leu Ser Ala
65   70   75   80

Thr His Pro Asn Glu Thr Val Gly Leu Asp Leu Ala Ala Ser Ser Glu
                85   90   95

Val Ala Gly Leu Ile Leu Leu Trp Glu Ala Gly Ala Ala Leu Glu Ala
                100   105   110

Phe Gln Leu Ala Arg Gln Gly Leu Gln Pro Pro Gln Ala Pro Ala Leu
        115   120   125

Gly Ser Gly Arg Glu Ala Asp Leu Thr Leu Leu Ala Ala Leu Ala Cys
    130   135   140

Arg Asp Ala Ala Arg Asp Glu Gln Gln Gln Arg Arg Tyr Glu Ser Ala
145   150   155   160

Ala Gln Leu Leu Arg Asp Gly Ile Glu Leu Gln Gln Arg Met Gly Lys
                165   170   175

Leu Pro Asp Gln Gln Ala Arg Leu Gln Gln Glu Leu Asp Asp Leu Leu
                180   185   190

Pro Tyr Arg Val Leu Asp Leu Leu Ser Arg Asp Leu Ser Asp Ala Asp
        195   200   205

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Ala Arg Gln Gln Gly Ile Ser Leu Leu Asp Gln Leu Val Arg Asp Arg
    210   215   220

Gly Gly Leu Asp Pro Glu Gly Leu Asp Ser Glu Thr Pro Ala Ala Met
225   230   235   240

Gly Gln Ala Asp Phe Glu Ser Phe Phe Gln Gln Ile Arg Arg Phe Leu
            245   250   255

Thr Val Gln Glu Gln Val Asp Leu Phe Arg Gly Trp Phe Ala Glu Gly
            260   265   270

Ser Ile Glu Ala Gly Cys Leu Ala Val Phe Ala Leu Ala Ala Ala Gly
    275   280   285

Tyr Ser Arg Arg Lys Pro Glu Phe Leu Glu Gln Ala Arg Glu Gln Leu
    290   295   300

Gln Arg Leu Val Ala Ser Asp Leu Asp Pro Met Pro Leu Leu Gly Cys
305   310   315   320

Leu Asp Leu Leu Leu Gly Asn Val Ala Glu Ala Ser Leu His Phe Ser
            325   330   335

Ala Ile Arg Asp Glu Glu Leu Leu Ser Trp Leu Ala Glu His Pro Gly
            340   345   350

Asp His Leu Ala Ala Gln Cys Glu Tyr Cys Arg Val Trp Leu Glu Arg
    355   360   365

Asp Val Leu Pro Gly Tyr Arg Asp Val Asp Ala Ala Gly Val Asp Leu
    370   375   380

Asp Ala Trp Phe Ala Asp Arg Asp Val Gln Ala Tyr Val Asp Arg Ile
385   390   395   400

Asp Arg Gln Ser Ala Arg Leu Gly Ser Ala Ala Thr Val Thr Gly Ala
            405   410   415

```
Gly Leu Ser Ser Ala Pro Ser Ala Asp Ala Ser Ser Pro His Glu Ala
        420             425             430

Ala Leu Asp Asp Asp His Leu Pro Ala Glu Glu Ala Pro Ser Ser Asp
        435             440             445

Pro Ala Asn Gln Arg Leu Ser Asn Arg Leu Arg Trp Leu Ala Ala Ser
    450             455             460

Leu Val Val Gly Leu Val Ala Ala Leu Ala Ala Ala Val Met Leu Arg
465             470             475             480

Pro Arg Glu Thr Ala Pro Val Val Leu Gln Pro Glu Pro Asp Arg Gln
            485             490             495

Asp Ala Val Glu Pro Lys Pro Ser Ala Gln Asp Ser Ala Thr Leu Lys
            500             505             510

Pro Gln Ala
        515


<210>   122
<211>   525
<212>   PRT
<213>   Oryza sativa

<400>   122

Ala Ala Glu Arg Ser Leu Pro Leu Gln Val Asp Phe Tyr Lys Val Leu
1               5               10              15

Gly Ala Glu Pro His Phe Leu Gly Asp Gly Ile Arg Arg Ala Phe Glu
            20              25              30

Ala Arg Ile Ala Lys Pro Pro Gln Tyr Gly Tyr Ser Thr Asp Ala Leu
        35              40              45

Val Gly Arg Arg Gln Met Leu Gln Ile Ala His Asp Thr Leu Met Asn
    50              55              60

Gln Asn Ser Arg Thr Gln Tyr Asp Arg Ala Leu Ser Glu Asn Arg Glu
65              70              75              80

Glu Ala Leu Thr Met Asp Ile Ala Trp Asp Lys Glu Ala Gly Glu Ala
            85              90              95
```

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Leu Ala Val Leu Val Thr Gly Glu Gln Leu Leu Leu Asp Arg Pro Pro
          100   105   110

Lys Arg Phe Lys Gln Asp Val Val Leu Ala Met Ala Leu Ala Tyr Val
          115   120   125

Asp Leu Ser Arg Asp Ala Met Ala Ala Ser Pro Pro Asp Val Ile Gly
    130   135   140

Cys Cys Glu Val Leu Glu Arg Ala Leu Lys Leu Leu Gln Glu Asp Gly
145   150   155   160

Ala Ser Asn Leu Ala Pro Asp Leu Leu Ser Gln Ile Asp Glu Thr Leu
              165   170   175

Glu Glu Ile Thr Pro Arg Cys Val Leu Glu Leu Leu Ser Leu Pro Ile
          180   185   190

Asp Thr Glu His His Lys Lys Arg Gln Glu Gly Leu Gln Gly Ala Arg
          195   200   205

Asn Ile Leu Trp Ser Val Gly Arg Gly Gly Ile Ala Thr Val Gly Gly
    210   215   220

Gly Phe Ser Arg Glu Ala Phe Met Asn Glu Ala Phe Leu Arg Met Thr
225   230   235   240

Ser Ile Glu Gln Met Asp Phe Phe Ser Lys Thr Pro Asn Ser Ile Pro
              245   250   255

Pro Glu Trp Phe Glu Ile Tyr Asn Val Ala Leu Ala His Val Ala Gln
          260   265   270

Ala Ile Ile Ser Lys Arg Pro Gln Phe Ile Met Met Ala Asp Asp Leu
    275   280   285

Phe Glu Gln Leu Gln Lys Phe Asn Ile Gly Ser His Tyr Ala Tyr Asp
    290   295   300

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```
Asn Glu Met Asp Leu Ala Leu Glu Arg Ala Phe Cys Ser Leu Leu Val
305             310             315             320

Gly Asp Val Ser Lys Cys Arg Met Trp Leu Gly Ile Asp Asn Glu Ser
            325             330             335

Ser Pro Tyr Arg Asp Pro Lys Ile Leu Glu Phe Ile Val Thr Asn Ser
            340             345             350

Ser Ile Ser Glu Glu Asn Asp Leu Leu Pro Gly Leu Cys Lys Leu Leu
            355             360             365

Glu Thr Trp Leu Ile Phe Glu Val Phe Pro Arg Ser Arg Asp Thr Arg
    370             375             380

Gly Met Gln Phe Arg Leu Gly Asp Tyr Tyr Asp Asp Pro Glu Val Leu
385             390             395             400

Ser Tyr Leu Glu Arg Met Glu Gly Gly Gly Ala Ser His Leu Ala Ala
            405             410             415

Ala Ala Ala Ile Ala Lys Leu Gly Ala Gln Ala Thr Ala Ala Leu Gly
            420             425             430

Thr Val Lys Ser Asn Ala Ile Gln Ala Phe Asn Lys Val Phe Pro Leu
            435             440             445

Ile Glu Gln Leu Asp Arg Ser Ala Met Glu Asn Thr Lys Asp Gly Pro
    450             455             460

Gly Gly Tyr Leu Glu Asn Phe Asp Gln Glu Asn Ala Pro Ala His Asp
465             470             475             480

Ser Arg Asn Ala Ala Leu Lys Ile Ile Ser Ala Gly Ala Leu Phe Ala
            485             490             495

Leu Leu Ala Val Ile Gly Ala Lys Tyr Leu Pro Arg Lys Arg Pro Leu
            500             505             510

Ser Ala Ile Arg Ser Glu His Gly Ser Val Ala Val Ala
            515             520             525


<210>  123
```

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<211> 578
<212> PRT
<213> Arabidopsis thaliana

<400> 123

Arg Pro Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu
1   5   10   15

Gly Ala Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu
                20   25   30

Ala Arg Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu
            35   40   45

Ile Ser Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn
        50   55   60

Pro Arg Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu
65   70   75   80

Ala Thr Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu
                85   90   95

Cys Val Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly
            100   105   110

Glu Ala Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val
            115   120   125

Val Leu Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met
        130   135   140

Ala Leu Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu
145   150   155   160

Ala Leu Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp
                165   170   175

Leu Arg Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr
                180   185   190

Val Leu Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys
            195   200   205

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Arg Leu Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly
    210   215   220

Gly Gly Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe
225   230   235   240

Met Asn Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu
                245   250   255

Phe Val Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr
            260   265   270

Glu Val Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro
        275   280   285

His Leu Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala
    290   295   300

Lys Val Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn
305   310   315   320

Asn Trp Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu
                325   330   335

Ile Gly Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu
            340   345   350

Asp Ser Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn
        355   360   365

Ser Asn Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu
    370   375   380

Glu Thr Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys
385   390   395   400

Asp Lys Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu
            405   410   415

Ser Tyr Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala
            420   425   430

Ala Ala Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala
    435   440   445

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Met Gln Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn
    450   455   460

Ser Ala Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro
465   470   475   480

Val Gly Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala
                485   490   495

Glu Ala Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile
                500   505   510

Arg Ala Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met
            515   520   525

Ser Val Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala
    530   535   540

Gly Val Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu
545   550   555   560

Lys Ser Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu
                565   570   575

Ser Asp

<210> 124
<211> 99
<212> PRT
<213> Solanum tuberosum

<400> 124

Pro Ser Asp His His Ile Ser Met Pro Ile Asp Phe Tyr Arg Val Leu
1   5   10   15

Gly Ala Glu Ala His Phe Leu Gly Asp Gly Ile Arg Arg Cys Tyr Asp
            20   25   30

Ala Arg Ile Thr Lys Pro Pro Gln Tyr Gly Tyr Ser Gln Glu Ala Leu
        35   40   45

Ile Gly Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ala Asp
    50   55   60

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Ser Thr Ser Arg Arg Glu Tyr Asn Gln Gly Leu Ala Gln His Glu Phe
65   70   75   80

Asp Thr Ile Leu Thr Pro Val Pro Trp Asp Lys Val Pro Gly Ala Met
              85   90   95

Cys Val Leu

<210> 125
<211> 760
<212> PRT
<213> Oryza sativa

<400> 125

Met Glu Gly Phe His Asn Leu Leu Ala Arg Pro Asn Ser Ala Pro Phe
1   5   10   15

Ala Phe Ser Leu Pro Arg Pro Arg Pro Arg Pro Arg Arg Arg Pro Pro
              20   25   30

Pro His Pro Ser Ala Ala Cys Arg Ala Ala Ser Arg Trp Ala Glu Arg
          35   40   45

Leu Phe Ala Asp Phe His Leu Leu Pro Thr Ala Ala Pro Ser Asp Pro
      50   55   60

Pro Ser Pro Ala Pro Ala Pro Ala Ala Ala Pro Ser Ala Ser Pro Phe
65   70   75   80

Val Pro Leu Phe Pro Asp Ala Ala Glu Arg Ser Leu Pro Leu Gln Val
              85   90   95

Asp Phe Tyr Lys Val Leu Gly Ala Glu Pro His Phe Leu Gly Asp Gly
              100   105   110

Ile Arg Arg Ala Phe Glu Ala Arg Ile Ala Lys Pro Pro Gln Tyr Gly
          115   120   125

Tyr Ser Thr Asp Ala Leu Val Gly Arg Arg Gln Met Leu Gln Ile Ala
      130   135   140

His Asp Thr Leu Met Asn Gln Asn Ser Arg Thr Gln Tyr Asp Arg Ala
145   150   155   160

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Leu Ser Glu Asn Arg Glu Glu Ala Leu Thr Met Asp Ile Ala Trp Asp
            165   170   175

Lys Glu Ala Gly Glu Ala Leu Ala Val Leu Val Thr Gly Glu Gln Leu
            180   185   190

Leu Leu Asp Arg Pro Pro Lys Arg Phe Lys Gln Asp Val Val Leu Ala
            195   200   205

Met Ala Leu Ala Tyr Val Asp Leu Ser Arg Asp Ala Met Ala Ala Ser
    210   215   220

Pro Pro Asp Val Ile Gly Cys Cys Glu Val Leu Glu Arg Ala Leu Lys
225   230   235   240

Leu Leu Gln Glu Asp Gly Ala Ser Asn Leu Ala Pro Asp Leu Leu Ser
            245   250   255

Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Cys Val Leu Glu
            260   265   270

Leu Leu Ser Leu Pro Ile Asp Thr Glu His His Lys Lys Arg Gln Glu
            275   280   285

Gly Leu Gln Gly Ala Arg Asn Ile Leu Trp Ser Val Gly Arg Gly Gly
    290   295   300

Ile Ala Thr Val Gly Gly Gly Phe Ser Arg Glu Ala Phe Met Asn Glu
305   310   315   320

Ala Phe Leu Arg Met Thr Ser Ile Glu Gln Met Asp Phe Phe Ser Lys
            325   330   335

Thr Pro Asn Ser Ile Pro Pro Glu Trp Phe Glu Ile Tyr Asn Val Ala
            340   345   350

Leu Ala His Val Ala Gln Ala Ile Ile Ser Lys Arg Pro Gln Phe Ile
            355   360   365

Met Met Ala Asp Asp Leu Phe Glu Gln Leu Gln Lys Phe Asn Ile Gly
    370   375   380

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```
Ser His Tyr Ala Tyr Asp Asn Glu Met Asp Leu Ala Leu Glu Arg Ala
385             390             395             400

Phe Cys Ser Leu Leu Val Gly Asp Val Ser Lys Cys Arg Met Trp Leu
            405             410             415

Gly Ile Asp Asn Glu Ser Ser Pro Tyr Arg Asp Pro Lys Ile Leu Glu
            420             425             430

Phe Ile Val Thr Asn Ser Ser Ile Ser Glu Glu Asn Asp Leu Leu Pro
            435             440             445

Gly Leu Cys Lys Leu Leu Glu Thr Trp Leu Ile Phe Glu Val Phe Pro
    450             455             460

Arg Ser Arg Asp Thr Arg Gly Met Gln Phe Arg Leu Gly Asp Tyr Tyr
465             470             475             480

Asp Asp Pro Glu Val Leu Ser Tyr Leu Glu Arg Met Glu Gly Gly Gly
            485             490             495

Ala Ser His Leu Ala Ala Ala Ala Ala Ile Ala Lys Leu Gly Ala Gln
            500             505             510

Ala Thr Ala Ala Leu Gly Thr Val Lys Ser Asn Ala Ile Gln Ala Phe
            515             520             525

Asn Lys Val Phe Pro Leu Ile Glu Gln Leu Asp Arg Ser Ala Met Glu
    530             535             540

Asn Thr Lys Asp Gly Pro Gly Gly Tyr Leu Glu Asn Phe Asp Gln Glu
545             550             555             560

Asn Ala Pro Ala His Asp Ser Arg Asn Ala Ala Leu Lys Ile Ile Ser
            565             570             575

Ala Gly Ala Leu Phe Ala Leu Leu Ala Val Ile Gly Ala Lys Tyr Leu
            580             585             590

Pro Arg Lys Arg Pro Leu Ser Ala Ile Arg Ser Glu His Gly Ser Val
    595             600             605

Ala Val Ala Asn Ser Val Asp Ser Thr Asp Asp Pro Ala Leu Asp Glu
    610             615             620
```

```
Asp Pro Val His Ile Pro Arg Met Asp Ala Lys Leu Ala Glu Asp Ile
625             630         635             640

Val Arg Lys Trp Gln Ser Ile Lys Ser Lys Ala Leu Gly Pro Glu His
                645             650             655

Ser Val Ala Ser Leu Gln Glu Val Leu Asp Gly Asn Met Leu Lys Val
            660             665             670

Trp Thr Asp Arg Ala Ala Glu Ile Glu Arg His Gly Trp Phe Trp Glu
        675             680             685

Tyr Thr Leu Ser Asp Val Thr Ile Asp Ser Ile Thr Ile Ser Leu Asp
    690             695             700

Gly Arg Arg Ala Thr Val Glu Ala Thr Ile Asp Glu Ala Gly Gln Leu
705             710             715             720

Thr Asp Val Thr Glu Pro Arg Asn Asn Asp Ser Tyr Asp Thr Lys Tyr
            725             730             735

Thr Thr Arg Tyr Glu Met Ala Phe Ser Lys Leu Gly Gly Trp Lys Ile
            740             745             750

Thr Glu Gly Ala Val Leu Lys Ser
        755             760


<210>   126
<211>   2283
<212>   DNA
<213>   Oryza sativa

<400>   126
atggagggct tccacaacct cctcgcccgc cccaactcgg cgccattcgc cttctccctc      60

cctcgcccgc gcccgcgccc gcgccgcagg ccgccgcctc acccctccgc tgcctgccgc     120

gccgcgagcc gctgggccga acgcctcttc gccgacttcc acctcctccc caccgccgcg     180

ccctccgacc cgccgtcccc ggcccccggcc ccggccgccg cgccctccgc ctccccttc     240

gtcccgctct ccccgacgc cgccgaacgc tccctcccgc tccaagtcga tttctacaag     300

gttctagggg cagagccaca tttccttggc gatggcatca ggagggcgtt cgaggcacgg     360

atagccaagc caccgcagta tggctacagc acggatgctc ttgttggtcg tcgacaaatg     420

ctgcagattg cccatgacac tctcatgaac cagaactccc gcactcagta tgatcgtgcg    ´480
```

-121-

```
ctttctgaga accgtgaaga agctctcacc atggatattg cttgggacaa ggaggctggg      540

gaggcacttg ctgtgcttgt aactggagaa cagttgcttc tggatcggcc acccaagcgc      600

ttcaagcagg acgtggtgct agcgatggct ctggcttatg tggatctatc aagggatgct      660

atggcagcaa gccctccaga tgtaattggc tgctgcgagg tgctcgagag ggctctcaag      720

ctcttgcagg aagatggagc aagcaatctc gcacctgatc tgctttcaca gattgatgaa      780

actctcgagg agattacacc tcgctgtgta ttggagcttc tctcccttcc tattgacaca      840

gagcatcata agaagcgcca agaagggctt caaggtgcga gaaacatttt gtggagcgtt      900

ggcagaggag gtattgctac cgttggagga ggattttctc gtgaagcctt catgaacgag      960

gctttttttga ggatgacatc aattgaacag atggatttct tttcaaaaac accgaatagc     1020

attcctcctg aatggtttga aatttacaat gtagcacttg cacatgtcgc tcaagcaatt     1080

ataagtaaaa ggccacaatt catcatgatg gcggatgatc tttttgaaca actccagaag     1140

ttcaacatag gttctcatta tgcttatgat aatgagatgg accttgcatt ggaaagggca     1200

ttctgctcat tgctagtcgg agatgttagc aagtgcagaa tgtggcttgg aattgataat     1260

gagtcttcac catacagaga ccccaaaatt ctagagttta ttgtgaccaa ctctagcatc     1320

agtgaagaga atgatcttct tccagggctg tgcaagcttt tggagacttg gcttatcttt     1380

gaggtttttc ctaggagcag agatactcgg ggcatgcagt tcagacttgg agattactac     1440

gatgatccag aagtttttaag ctacctagaa aggatggagg gtggtggtgc ttctcatttg     1500

gctgctgctg ctgctattgc aaaacttggt gctcaagcta cagctgcact tggtactgtg     1560

aaatcaaatg ctattcaagc gttcaacaag gtttttccat tgatagaaca gttagacagg     1620

tcagccatgg aaaatactaa agatggccct gggggatatc ttgaaaattt tgaccaggaa     1680

aatgcacctg ctcatgattc gagaaatgcc gccttgaaga ttatctctgc tggcgcactg     1740

tttgcactgt tggcagtaat tggggccaaa tatttgcctc gtaagaggcc cctttctgct     1800

attaggagtg agcatggatc tgtggcagtt gctaatagtg tcgactctac tgatgatcct     1860

gcactagatg aagatccagt acatattcct agaatggatg cgaagctggc agaagatatt     1920

gttcgcaagt ggcagagtat caaatctaag gccttgggac cagaacattc ggttgcatca     1980

ttgcaagagg ttcttgatgg caacatgcta aaggtgtgga ctgaccgagc agcggagatt     2040

gagcgtcatg ggtggttctg ggagtataca ctatccgatg tgacgattga tagcatcact     2100

atctccctag atggtcgacg agcgactgtg gaggctacga ttgatgaggc aggccaactt     2160
```

-122-

actgatgtta ctgagcccag aaacaatgat tcatatgaca caaaatacac tacccggtat   2220

gagatggcct tctccaagct aggagggtgg aagataacgg aaggagcagt cctcaagtcg   2280

tag   2283

<210> 127
<211> 801
<212> PRT
<213> Arabidopsis thaliana

<400> 127

Met Glu Ala Leu Ser His Val Gly Ile Gly Leu Ser Pro Phe Gln Leu
1   5   10   15

Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His Asn Thr
            20   25   30

Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser
        35   40   45

Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Ser Phe Ala Thr Ala
    50   55   60

Thr Thr Thr Ala Thr Leu Val Ser Pro Pro Pro Ser Ile Asp Arg Pro
65   70   75   80

Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala
            85   90   95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg
            100   105   110

Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser
            115   120   125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg
        130   135   140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr
145   150   155   160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val
                165   170   175

-123-

```
Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala
        180                 185                 190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu
        195                 200                 205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu
    210                 215                 220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu
225                 230                 235                 240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg
            245                 250                 255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu
            260                 265                 270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu
        275                 280                 285     .

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly
        290                 295                 300

Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe Met Asn
305                 310                 315                 320

Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu Phe Val
            325                 330                 335

Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr Glu Val
            340                 345                 350

Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro His Leu
            355                 360                 365

Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala Lys Val
    370                 375                 380

Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn Asn Trp
385                 390                 395                 400

Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu Ile Gly
            405                 410                 415
```

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```
Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu Asp Ser
        420         425             430

Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn Ser Asn
        435         440             445

Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu Glu Thr
        450         455             460

Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys Asp Lys
465         470             475             480

Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu Ser Tyr
            485             490             495

Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala Ala Ala
            500             505             510

Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala Met Gln
        515             520             525

Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala
        530             535             540

Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly
545             550             555             560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala
            565             570             575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala
            580             585             590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val
            595             600             605

Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val
        610             615             620

Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser
625             630             635             640
```

```
Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp
            645                 650             655

Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro
            660                 665             670

Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys
            675                 680             685

Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro
            690                 695             700

Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala
705                 710                 715             720

Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu
            725                 730                 735

Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val
            740                 745                 750

Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro
            755                 760                 765

Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val
    770                 775                 780

Phe Trp Ser Lys Ser Gly Trp Lys Ile Thr Glu Gly Ser Val Leu Ala
785                 790                 795                 800

Ser


<210> 128
<211> 2406
<212> DNA
<213> Arabidopsis thaliana

<400> 128
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ccggcgacga caaagctccg acgtagccac aacacctcta caactatctg ctccgccagc   120

aaatgggccg accgtcttct ctccgacttc aatttcacct ccgattcctc ctcctcctcc   180

ttcgccaccg ccaccaccac cgccactctc gtctctccgc caccatctat tgatcgtccc   240
```

-126-

```
gaacgccacg tccccatccc cattgatttc taccaggtat taggagctca aacacatttc    300

ttaaccgatg gaatcagaag agcattcgaa gctagggttt cgaaaccgcc gcaattcggt    360

ttcagcgacg acgctttaat cagccggaga cagattcttc aagctgcttg cgaaactctg    420

tctaatcctc ggtctagaag agagtacaat gaaggtcttc ttgatgatga agaagctaca    480

gtcatcactg atgttccttg ggataaggtt cctggtgctc tctgtgtatt gcaagaaggt    540

ggtgagactg agatagttct tcgggttggt gaggctctgc ttaaggagag gttgcctaag    600

tcgtttaagc aagatgtggt tttagttatg gcgcttgcgt ttctcgatgt ctcgagggat    660

gctatggcat tggatccacc tgattttata actggttatg agtttgttga ggaagctttg    720

aagcttttac aggaggaagg agcaagtagc cttgcaccgg atttacgtgc acaaattgat    780

gagactttgg aagagatcac tccgcgttat gtcttggagc tacttggctt accgcttggt    840

gatgattacg ctgcgaaaag actaaatggt ttaagcggtg tgcggaatat tttgtggtct    900

gttggaggag gtggagcatc agctcttgtt gggggtttga cccgtgagaa gtttatgaat    960

gaggcgtttt tacgaatgac agctgctgag caggttgatc tttttgtagc tacccccaagc   1020

aatattccag cagagtcatt tgaagtttac gaagttgcac ttgctcttgt ggctcaagct   1080

tttattggta agaagccaca ccttttacag gatgctgata agcaattcca gcaacttcag   1140

caggctaagg taatggctat ggagattcct gcgatgttgt atgatacacg gaataattgg   1200

gagatagact tcggtctaga aaggggactc tgtgcactgc ttataggcaa agttgatgaa   1260

tgccgtatgt ggttgggctt agacagtgag gattcacaat ataggaatcc agctattgtg   1320

gagtttgttt tggagaattc aaatcgtgat gacaatgatg atctccctgg actatgcaaa   1380

ttgttggaaa cctggttggc aggggttgtc tttcctaggt tcagagacac caaagataaa   1440

aaatttaaac tcggggacta ctatgatgat cctatggttt tgagttactt ggaaagagtg   1500

gaggtagttc agggttctcc tttagctgct gctgcagcta tggcaaggat tggagccgag   1560

catgtgaaag ctagtgctat gcaggcactg cagaaagttt ttccttcccg ctatacagat   1620

agaaactcgg ctgaacccaa ggatgtgcaa gagacagtgt ttagtgtaga tcctgttggt   1680

aacaatgtag gccgtgatgg tgagcctggt gtctttattg cagaagctgt aagaccctct   1740

gaaaactttg aaactaatga ttatgcaatt cgagctgggg tctcagagag tagcgttgat   1800

gaaactactg ttgaaatgtc cgttgctgat atgttaaagg aggcaagtgt gaagatccta   1860

gctgctggtg tggcaattgg actgatttca ctgttcagcc agaagtattt tcttaaaagc   1920

agctcatctt ttcaacgcaa ggatatggtt tcttctatgg aatctgatgt cgctaccata   1980
```

-127-

```
gggtcagtca gagctgacga ttcagaagca cttcccagaa tggatgctag gactgcagag      2040

aatatagtat ccaagtggca gaagattaag tctctggctt ttgggcctga tcaccgcata      2100

gaaatgttac cagaggtttt ggatgggcga atgctgaaga tttggactga cagagcagct      2160

gaaactgcgc agcttgggtt ggtttatgat tatacactgt tgaaactatc tgttgacagt      2220

gtgacagtct cagcagatgg aacccgtgct ctggtggaag caactctgga ggagtctgct      2280

tgtctatctg atttggttca tccagaaaac aatgctactg atgtcagaac ctacacaaca      2340

agatacgaag ttttctggtc caagtcaggg tggaaaatca ctgaaggctc tgttcttgca      2400

tcataa                                                                 2406


<210>    129
<211>    801
<212>    PRT
<213>    Arabidopsis thaliana

<400>    129

Met Glu Ala Leu Ser His Val Gly Ile Gly Leu Ser Pro Phe Gln Leu
1               5                   10                  15


Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His Asn Thr
            20                  25                  30


Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser
        35                  40                  45


Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Phe Ala Thr Ala
    50                  55                  60


Thr Thr Thr Ala Thr Leu Val Ser Pro Pro Ser Ile Asp Arg Pro
65                  70                  75                  80


Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala
                85                  90                  95


Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg
            100                 105                 110


Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser
            115                 120                 125


Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg
        130                 135                 140
```

-128-

```
Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr
145             150         155                 160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val
                165             170                 175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala
            180             185             190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu
            195             200             205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu
    210             215             220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu
225             230             235             240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg
            245             250             255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu
            260             265             270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu
    275             280             285

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly
    290             295             300

Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe Met Asn
305             310             315             320

Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu Phe Val
            325             330             335

Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr Glu Val
            340             345             350

Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro His Leu
    355             360             365
```

Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala Lys Val
    370   375   380

Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn Asn Trp
385   390   395   400

Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu Ile Gly
            405   410   415

Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu Asp Ser
            420   425   430

Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn Ser Asn
        435   440   445

Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu Glu Thr
    450   455   460

Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys Asp Lys
465   470   475   480

Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu Ser Tyr
            485   490   495

Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala Ala Ala
        500   505   510

Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala Met Gln
        515   520   525

Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala
    530   535   540

Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly
545   550   555   560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala
            565   570   575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala
        580   585   590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val
        595   600   605

-130-

```
Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val
    610             615             620
```

```
Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser
625             630             635                     640
```

```
Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp
            645             650                 655
```

```
Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro
            660             665             670
```

```
Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys
        675             680             685
```

```
Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro
    690             695             700
```

```
Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala
705             710             715                     720
```

```
Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu
            725             730                 735
```

```
Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val
            740             745             750
```

```
Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro
        755             760             765
```

```
Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val
    770             775             780
```

```
Phe Trp Ser Lys Ser Gly Trp Lys Ile Thr Glu Gly Ser Val Leu Ala
785             790             795                     800
```

```
Ser
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<210> 130
<211> 2637
<212> DNA
<213> Arabidopsis thaliana

<400> 130

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ttcaatatgt aaaacagaac aaagtttttg tagtagccta aaaagacact cccatggaag     120

ctctgagtca cgtcggcatt ggtctctccc cattccaatt atgccgatta ccaccggcga     180

cgacaaagct ccgacgtagc cacaacacct ctacaactat ctgctccgcc agcaaatggg     240

ccgaccgtct tctctccgac ttcaatttca cctccgattc ctcctcctcc tccttcgcca     300

ccgccaccac caccgccact ctcgtctctc cgccaccatc tattgatcgt cccgaacgcc     360

acgtccccat ccccattgat ttctaccagg tattaggagc tcaaacacat ttcttaaccg     420

atggaatcag aagagcattc gaagctaggg tttcgaaacc gccgcaattc ggtttcagcg     480

acgacgcttt aatcagccgg agacagattc ttcaagctgc ttgcgaaact ctgtctaatc     540

ctcggtctag aagagagtac aatgaaggtc ttcttgatga tgaagaagct acagtcatca     600

ctgatgttcc ttgggataag gttcctggtg ctctctgtgt attgcaagaa ggtggtgaga     660

ctgagatagt tcttcgggtt ggtgaggctc tgcttaagga gaggttgcct aagtcgttta     720

agcaagatgt ggttttagtt atggcgcttg cgtttctcga tgtctcgagg gatgctatgg     780

cattggatcc acctgatttt ataactggtt atgagtttgt tgaggaagct ttgaagcttt     840

tacaggagga aggagcaagt agccttgcac cggatttacg tgcacaaatt gatgagactt     900

tggaagagat cactccgcgt tatgtcttgg agctacttgg cttaccgctt ggtgatgatt     960

acgctgcgaa aagactaaat ggtttaagcg gtgtgcggaa tattttgtgg tctgttggag    1020

gaggtggagc atcagctctt gttggggggtt tgacccgtga gaagtttatg aatgaggcgt    1080

ttttacgaat gacagctgct gagcaggttg atctttttgt agctacccca agcaatattc    1140

cagcagagtc atttgaagtt tacgaagttg cacttgctct tgtggctcaa gcttttattg    1200

gtaagaagcc acacctttta caggatgctg ataagcaatt ccagcaactt cagcaggcta    1260

aggtaatggc tatggagatt cctgcgatgt tgtatgatac acggaataat tgggagatag    1320

acttcggtct agaaaggggga ctctgtgcac tgcttatagg caaagttgat gaatgccgta    1380

tgtggttggg cttagacagt gaggattcac aatataggaa tccagctatt gtggagtttg    1440

ttttggagaa ttcaaatcgt gatgacaatg atgatctccc tggactatgc aaattgttgg    1500

aaacctggtt ggcaggggtt gtctttccta ggttcagaga caccaaagat aaaaaattta    1560

aactcgggga ctactatgat gatcctatgg ttttgagtta cttggaaaga gtggaggtag    1620

ttcagggttc tcctttagct gctgctgcag ctatggcaag gattggagcc gagcatgtga    1680

aagctagtgc tatgcaggca ctgcagaaag ttttttcttc ccgctataca gatagaaact    1740
```

-132-

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cggctgaacc caaggatgtg caagagacag tgtttagtgt agatcctgtt ggtaacaatg    1800

taggccgtga tggtgagcct ggtgtcttta ttgcagaagc tgtaagaccc tctgaaaact    1860

ttgaaactaa tgattatgca attcgagctg gggtctcaga gagtagcgtt gatgaaacta    1920

ctgttgaaat gtccgttgct gatatgttaa aggaggcaag tgtgaagatc ctagctgctg    1980

gtgtggcaat tggactgatt tcactgttca gccagaagta ttttcttaaa agcagctcat    2040

cttttcaacg caaggatatg gtttcttcta tggaatctga tgtcgctacc atagggtcag    2100

tcagagctga cgattcagaa gcacttccca gaatggatgc taggactgca gagaatatag    2160

tatccaagtg gcagaagatt aagtctctgg cttttgggcc tgatcaccgc atagaaatgt    2220

taccagaggt tttggatggg cgaatgctga agatttggac tgacagagca gctgaaactg    2280

cgcagcttgg gttggtttat gattatacac tgttgaaact atctgttgac agtgtgacag    2340

tctcagcaga tggaacccgt gctctggtgg aagcaactct ggaggagtct gcttgtctat    2400

ctgatttggt tcatccagaa aacaatgcta ctgatgtcag aacctacaca acaagatacg    2460

aagttttctg gtccaagtca gggtggaaaa tcactgaagg ctctgttctt gcatcataat    2520

atactcatat gtagcatgtc tgagcttgcg agattctctt tgttttgtaa attctctctc    2580

taagttagtg tttataaatg aacacaaaaa aattaacgtt caaaaaaaaa aaaaaa        2637
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<210> 131
<211> 801
<212> PRT
<213> Arabidopsis thaliana

<400> 131

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Met Glu Ala Leu Ser His Val Gly Ile Gly Leu Ser Pro Phe Gln Leu
1               5                   10                  15


Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His Asn Thr
            20                  25                  30


Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser
        35                  40                  45


Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Phe Ala Thr Ala
    50                  55                  60


Thr Thr Thr Ala Thr Leu Val Ser Pro Pro Pro Ser Ile Asp Arg Pro
65                  70                  75                  80
```

-133-

```
Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala
            85              90              95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg
            100             105             110

Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser
            115             120             125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg
    130             135             140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr
145             150             155             160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val
            165             170             175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala
            180             185             190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu
            195             200             205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu
    210             215             220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu
225             230             235             240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg
            245             250             255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu
            260             265             270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu
            275             280             285

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly
    290             295             300

Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe Met Asn
305             310             315             320
```

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Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu Phe Val
            325   330   335

Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr Glu Val
            340   345   350

Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro His Leu
            355   360   365

Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala Lys Val
    370   375   380

Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn Asn Trp
385   390   395   400

Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu Ile Gly
            405   410   415

Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu Asp Ser
            420   425   430

Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn Ser Asn
    435   440   445

Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu Glu Thr
    450   455   460

Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys Asp Lys
465   470   475   480

Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu Ser Tyr
            485   490   495

Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala Ala Ala
            500   505   510

Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala Met Gln
    515   520   525

Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala
    530   535   540

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Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly
545   550   555   560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala
            565   570   575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala
            580   585   590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val
            595   600   605

Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val
    610   615   620

Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser
625   630   635   640

Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp
            645   650   655

Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro
            660   665   670

Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys
    675   680   685

Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro
    690   695   700

Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala
705   710   715   720

Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu
            725   730   735

Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val
            740   745   750

Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro
    755   760   765

Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val
    770   775   780

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Phe Trp Ser Lys Ser Gly Trp Lys Ile Thr Glu Gly Ser Val Leu Ala
785                 790             795             800

Ser


<210>  132
<211>  561
<212>  DNA
<213>  Arabidopsis thaliana


<220>
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<222>  (127)..(127)
<223>  n is a, c, g, or t

<220>
<221>  misc_feature
<222>  (520)..(520)
<223>  n is a, c, g, or t

<220>
<221>  misc_feature
<222>  (541)..(541)
<223>  n is a, c, g, or t

<400>  132
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gctacatatg agtatattat gatgcaagaa cagagccttc agtgattttc caccctgact     120

tggaccngaa aacttcgtat cttgttgtgt aggttctgac atcagtagca ttgttttctg     180

gatgaaccaa atcagataga caagcagact cctccagagt tgcttccacc agagcacggg     240

ttccatctgc tgagactgtc acactgtcaa cagatagttt caacagtgta taatcataaa     300

ccaacccaag ctgcgcagtt tcagctgctc tgtcagtcca aatcttcagc attcgcccat     360

ccaaaacctc tggtaacatt tctatgcggt gatcaggccc aaaagccaga gacttaatct     420

tctgccactt ggatactata ttctctgcag tcctagcatc cattctggga agtgcttctg     480

aatcgtcagc tctgactgac cctatggtag cgacatcagn ttccatagaa gaaaccatat     540

ncttgcgttg aaaagatgag c                                              561


<210>  133
<211>  295
<212>  DNA
<213>  Medicago truncatula
```

<400> 133
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ctggtgtagc aattggactc ataactttag ctggtttgaa gattttacct tctaaaaatg      60

gctcgcccgt tcttcacaaa gtgactggtt cagcaattgc gtcagatact atcaatttag     120

gtcctgtagg agatgaagaa ttaggagagc aactaccaaa aatgagtgca atggttgcag     180

aagctctagt ccgcaagtgg caatatatca catcccaagc ttttggacct gaccattgcc     240

taggaagatt gcaagaggtg ttggacggcc aaatgttgaa gatatggact gatcg          295
```

<210> 134
<211> 527
<212> DNA
<213> Medicago truncatula

<400> 134
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cccaagcttt tggacctgac cattgcctag gaagattgca agaggtgttg gacggcgaaa      60

tgttgaagat atggactgat cgagcagctg agattgcaga gcttggttgg tcatatgact     120

acaacttgga ggatctcaac atcgacagtg tgaccatatc acagaatggg cggcgtgcag     180

tagtggaaac aactctcaaa gagtctaccc acctcactgc tgttggtcat ccacagcatg     240

ctacttccaa cagcagaacc tacacaacaa gatatgaaat gtctttttca gattcagggt     300

ggaaaattat tgaaggagct gtccttgagt cgtaattagg ttttgtaata tgtaatatat     360

gtcaggttag tacacttcaa tattaacccc ctcgagccta tgcccactgt cttgtatgta     420

cctgttgttt tgtgcatttt tcaagcattt atgtagtcag gctgtaaata cttggagggt     480

atttgatcaa ataattatcc ggttaaaaaa aaaaaaaaaa aaaaaaa                    527
```

<210> 135
<211> 660
<212> DNA
<213> Medicago truncatula

<400> 135
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cacgcttctc caaaaaacct aaccgtctcc attcctccgc cgtctccgcc accagtaaat      60

gggcggagcg actcatttcc gatttccaat tcctcggcga cacctcctct tcctcctcca     120

ccaccacctc cgccacagtc actctcactc cttcttaccc tcctccgata gaacgccacg     180

tgtcactccc tctcgacctg tacaaaatcc tcggcgccga aacgcatttt ctcggtgatg     240

gtattcggag agcttatgaa gcgaaattct cgaagcctcc tcagtatgct ttcagtaatg     300

aagctttgat tagtcgtcgt cagattcttc aagctgcttg tgaaaccota gctgatcctg     360

cttctagaag agagtataat caaagcctcg tcgacgatga agacgaagat gaggaatctt     420

ccattctcac tgaaatccct ttcgacaaag ttcctggagc tctgtgcgtg ttgcaagaag     480
```

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```
ctggagagac ggagttggtg cttcggattg gaggggtttt actgagagag aggttaccga      540

agatgtttaa gcaagatgtt gtgttggcta tggcgcttgc atatgttgac gtttctaggg      600

atgctatggc tttgtccccg ccagatttca ttgttgcttg tgagatgctg gaaagggcat      660


<210>   136
<211>   187
<212>   DNA
<213>   Glycine max

<400>   136
agcgttgtgt gtgttgcagg aagctggaga gacggagctt gtgcttgaga ttgggcaggg       60

tttgcttagg gagaggttgc cgaagacgtt taagcaggat gttgtgttgg ctatggcact      120

cgcatttgtt gacgtgtcaa gggatgcttg gcttgttcac cggatttcat tgcggctgtg      180

agatgct                                                                 187


<210>   137
<211>   608
<212>   DNA
<213>   Solanum tuberosum

<400>   137
ggaaagcttc cttaacaatg gaggcattaa cacagctaag ctttggcatt tgtactccac       60

gcctttcatc accatttcaa ctagccgccg ccggtggtaa gaagccgccg agactcaatg      120

ccgttaacgg aggagctagt agtgttaccg gtggaacaag tagtttacct actaacttct      180

ccgctagtaa atgggcggat cgtcttctcg ccgatttcca attccttcct tccaccacca      240

cctccgactc atcggatttc cagaattcaa cttctacaac ctccgttacg actattcctc      300

ctcctgttgc tccttcagac caccacattt caatgcctat agacttttat agagtgcttg      360

gtgctgaagc tcacttcctc ggtgacggta ttaggagatg ctacgatgct agaattacaa      420

agcctccgca gtacggatac agtcaggaag cattgattgg ccgacggcag attcttcaag      480

ctgcttgtga aacccttgct gactctacct ctcgtagaga gtacaatcaa ggcctcgctc      540

agcatgagtt cgatactatt ctaactcctg tcccctggga taaagttccg ggagcaatgt      600

gtgttttg                                                                608
```

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<210> 138
<211> 307
<212> DNA
<213> Populus balsamifera

<400> 138
gaagatttca tgaatgaggc cttcttacgt atgacagcag ctgagcaggt tgatctgttc   60

gtcaccacgc caagtaatat cccggctcaa aattttgaag tttatggagt ggcacttgcc   120

cttgttgccc aagctttcat tggtaaaaag cctcatctca tcacagatgc tgataaccta   180

ttcggacagc ttcagcagat taaggtaaca aatcaaggga gtcttgttcc tgtctttggt   240

tccatggaaa accgtgatat tgactttggg ttggagaggg gctttgttca ctgcttgtag   300

gccagct   307

<210> 139
<211> 416
<212> DNA
<213> Mesembryanthemum crystallinum

<400> 139
gggaaacgtg ccttggtgga agcaactctt caagaatcag cgcagttaac tgacgttaac   60

caacctgagc ataacgattc ttacagcaga acatacacaa caaggtacga gatgtttcac   120

tccaatgctg ggtggaagat catagaggga gctgtcctcc aatcttaagc tgctggaaat   180

ccagtcttga atgtacatat tttcacatca tctgcacatt atgaatgaag gatggtatgt   240

gttttctgga cagtggtatt tgatcatgtt gtgtttattt tggtaacaag ttttgatcat   300

tatcaaaaag atcactcttg taagttagtt ttttccacaa taaatcaact atttatatga   360

aagtttttat atcaggacta cttgccttta cttatataaa ctttgagaaa tttttt   416

<210> 140
<211> 465
<212> DNA
<213> Oryza sativa

<220>
<221> misc_feature
<222> (113)..(113)
<223> n is a, c, g, or t

<400> 140
tggtgcttct catttgggct gctgctgctg ctattgcaaa acttggtgct caagctacag   60

ctgcacttgg tactgtgaaa tcaaatgcta ttcaagcgtt caacaaggtt ttnccattga   120

tagaacagtt agacaggtca gccatggaaa atactaaaga tggccctggg ggatatcttg   180

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```
aaaattttga ccaggaaaat gcacctgctc atgattcgag aaatgccgcc ttgaagatta    240

tctctctggc gcactgtttg cactgttggc agtaattggg gccaaatatt tgcctcgtaa    300

gaggcccctt tctgctatta ggagtgagca tggatctgtg gcagttgcta atagtgtcga    360

ctctactgat gatcctgcac tagatgaaga tccagtacat attcctagaa tggatgcgaa    420

gctggcagaa gatattgttc gcaagtggca gagtatcaaa tctaa                    465


<210>  141
<211>  309
<212>  DNA
<213>  Oryza sativa

<400>  141
atcataagaa gcgccaagaa gggcttcaag gtgcgagaaa cattttgtgg agcgttggca     60

gaggaggtat tgctaccgtt ggaggaggat tttctcgtga agccttcatg aacgaggctt    120

ttttgaggat gacatcaatt gaacagatgg atttcttttc aaaaacaccg aatagcattc    180

ctcctgaatg gtttgaaatt tacaatgtag cacttgcaca tgtcgctcaa gcaattataa    240

gtaaaaggcc acaattcatc atgatggcgg atgatctttt tgaacaactc cagaagttcc    300

acataggtc                                                            309


<210>  142
<211>  336
<212>  DNA
<213>  Oryza sativa

<400>  142
atcataagaa gcgccaagaa gggcttcaag gtgcgagaaa cattttgtgg agcgttggca     60

gaggaggtat tgctaccgtt ggaggaggat tttctcgtga agccttcatg aacgaggctt    120

ttttgaggat gacatcaatt gaacagatgg atttcttttc aaaaacaccg aatagcattc    180

ctcctgaatg gtttgaaatt tacaatgtag cacttgcaca tgtcgctcaa gcaattataa    240

gtaaaaggcc acaattcatc atgatggcgg atgatctttt tgaacaactc cagaagttca    300

acataggttc tcattatgct tatgataatg agatgg                              336


<210>  143
<211>  537
<212>  DNA
<213>  Triticum aestivum

<400>  143
cagtgcttgc aattggaggg cacttactgg aggaccgccc gcccaagcgg ttcaagcagg     60

atgtggtgct ggcaatggcg ctcgcttatg tggatctatc aagggacgca atggcggcta    120
```

```
gccctccaga tgtaatccgc tgctgtgagg tgcttgaaag ggctctcaag cttttgcagg      180

aggatggggc aatcaatctc gcacctggtt tgctctcaca aattgatgaa actctggagg      240

atatcacacc tcgttgtgtt ttggagcttc ttgcccttcc tcttgatgaa aaacatcaga      300

atgaacacca agaaggtctt cgtggtgtga gaaacatttt gtggagtgtt ggcagaggag      360

gtattggtac tgttggagga ggattttcgc gtgaagccta catgaatgaa gccttcctgc      420

agatgacatc ggcggagcag atggatttct tctcaaaaac accgaatagc ataccgcctg      480

aatggtttga aatctatagc gtggcacttg caaatgttgc tcaagcaatt gtaagta       537
```

```
<210>   144
<211>   418
<212>   DNA
<213>   Triticum monococcum


<220>
<221>   misc_feature
<222>   (144)..(144)
<223>   n is a, c, g, or t

<220>
<221>   misc_feature
<222>   (301)..(301)
<223>   n is a, c, g, or t

<400>   144
acacctcgtt gtgttttgga gcttcttgcc cttcctcttg atgaaaagca ccagagtaaa       60

cgccaagaag gtcttcgtgg tgtgagaaac attttgtgga gtgttggtag aggaggtatt      120

gctactgttg gaggaggatt ttcncgtgaa gcctacatga atgaggcctt tttgcagatg      180

acatcagcgg agcagatgga tttcttttca aaaacgccaa atagcatacc acctgaatgg      240

tttgaaatct atagtgtggc actcgcaaat gttgctcaag caattgtaag taaaaggcca      300

nagctcatca tggtggcaga tgatcttttc gaacagctcc agaagttcaa tataggttct      360

caatatgctt atgataatga attggatctt gtgttggaaa gggcactttg ctcattgc       418
```

```
<210>   145
<211>   480
<212>   DNA
<213>   Hordeum vulgare

<400>   145
gcgagcatga gtccgtggca gttgctaatg ttgttgactc aggtgatgat gacgaaccag       60

atgagcccat acagattcct aaaatggatg cgaagctggc agaagatatt gttcgcaagt      120

ggcagagcat caaatccaag gccttgggat cagatcattc tgttgcatca ttgcaagagg      180
```

```
ttcttgatgg caacatgctg aaggtatgga cggaccgagc agcagagatc gagcgcaaag    240

gctggttctg ggactacacg ctgtccaacg tggcgatcga cagcatcacc gtctccctgg    300

acggacggcg ggcgaccgtg gaggcgacaa ttgaggaggc gggtcagctc accgacgcaa    360

ccgaccccag gaacgatgat ttgtacgaca ctaagtacac cacccggtac gagatggcct    420

tcaccggacc aggagggtgg aagataaccg aaggcgcagt cctcaagtcg tcatagggcg    480
```

```
<210>   146
<211>   622
<212>   DNA
<213>   Hordeum vulgare


<220>
<221>   misc_feature
<222>   (11)..(12)
<223>   n is a, c, g, or t

<220>
<221>   misc_feature
<222>   (14)..(14)
<223>   n is a, c, g, or t

<220>
<221>   misc_feature
<222>   (65)..(65)
<223>   n is a, c, g, or t

<220>
<221>   misc_feature
<222>   (88)..(88)
<223>   n is a, c, g, or t

<400>   146
gaaactctgg nngnagatca cccctcgttg tgttttagag cttcttgccc ttcctcttga    60

cgagnaagca ccagagtaaa cgccaagnaa ggtcttcgtg gtgtgagaaa cattttgtgg    120

agtgttggta gaggaggtat tgctactgtt ggtggaggat tttcacggga agcctacatg    180

aatgaggcct ttttgcagat gacatcagct gagcagatgg atttcttttc aaaaacgccg    240

aatagcatac cacctgaatg gtttgaaatc tatagcgtgg cactcgcaaa tgttgctcaa    300

gcaattgtaa gtaaaaggcc agagctcatc atggtggcag atgatctttt cgaacagctc    360

cagaagttca atatcggttc tcaatatgct tatggtaacg agatggatct tgcgttggaa    420

agggcacttt gctcattgct tgtgggagac attagcaact gcagaacttg gcttgcgatt    480
```

```
gataatgaat cttcaccaca tagagacccg aaaattgtag agtttattgt gaacaactct    540

agcattgacc accaggagaa tgatcttctt ccaggcctgt gtaagctttt ggagacttgg    600

cttgtctcag aggttttccc ta                                             622


<210>   147
<211>   604
<212>   DNA
<213>   Hordeum vulgare


<220>
<221>   misc_feature
<222>   (13)..(13)
<223>   n is a, c, g, or t

<220>
<221>   misc_feature
<222>   (516)..(516)
<223>   n is a, c, g, or t

<400>   147
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agcctagcaa taatccgaat agaacacacc gaaaaacaaa gctcatcgct gactaactga    120

ctaaccaaac tatctccgtc ttccaaactg acaagagcct agactagact gcttatttac    180

acaccagaaa aacacgggag gaatcaatca acaaggttta ctgcacgctg aacgccctat    240

gacgacttga ggactgcgcc ttcggttatc ttccaccctc ctggtccggt gaaggccatc    300

tcgtaccggg tggtgtactt agtgtcgtac aaatcatcgt tcctggggtc ggttgcgtcg    360

gtgagctgac ccgcctcctc aattgtcgcc tccacggtcg cccgccgtcc gtccagggag    420

acggtgatgc tgtcgatcgc cacgttgaac agcgtgtagt cccagaacca gcctttgcgc    480

tcaatctctg ctgctcggtc tgtccatacc ttcagnatgt tgccatcaag aacctcttgc    540

aatgatgcaa cagaatgatc tgatcccaag gccttggatt tgatgctctg ccacttgcga    600

acaa                                                                 604


<210>   148
<211>   653
<212>   DNA
<213>   Sorghum bicolor

<400>   148
tatgggtctg tggcagttgc tgactctgtt gatggtctgg gagcagatga agagccacta     60

gaaattccta gaatggatgc aaagttggct gaagatattg ttcgcaagtg gcaaagtatc    120
```

```
aagtccaagg ctttggggcc agaacacact gtcacggcat tgcaagagat cctcgatggc      180

aacatgctga aggtatggat ggaccgagcc acagagattg agcgtcacgg ttggttctgg      240

gaatacacac tctccgacgt gacgatcgac agtatcaccg tctccatgga cggtcgacgg      300

gcaactgtgg aggcgacgat tgaggagatg ggccaactta ccgacgtagc agacccaaag      360

aacaacgacg cctacgacac aaagtacacc gctcggtacg agatgagcta ctccaagtcc      420

ggagggtgga ggatcaccga aggagcagtc ctcaagtcgt agaacggtcg tgcagcagga      480

gtaggcgagt aggggttgct caactcccat tctttttct tttgcaccag tgtatgtaaa      540

taaacagtgt gagcacaggt tcttttctct cctggagaga gtttggttag gttgattagt      600

gatgagttcc tgaggccgag agaatttgtc atctagtttg tattgataga gat      653
```

<210>   149
<211>   535
<212>   DNA
<213>   Sorghum bicolor

<400>   149
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gcacgaggat agaacagcta gacagatcag gcaaggatac cccaggtgat gatcttgaga       60

aatctcttga aaaacttgcc caagaaatgt tgctggagat gctatccatg attccaaaaa      120

tgccgctttg aagattatct ctgctggtgc actgtttgca ctatttgcag taataggtct      180

gaagtgcttg cctcgtaaga agtcacttcc tgctcttaag agcgaatatg ggtctgtggc      240

agttgctgac tctgttgatg gtctgggagc agatgaagag ccactagaaa ttcctagaat      300

ggatgcaaag ttggctgaag atattgttcg caagtggcaa agtatcaagt ccaaggcttt      360

ggggccagaa cacactgtca cggcattgca agagatcctc gatggcaaca tgctgaaggt      420

atggatggac cgagccacag agattgagcg tcacggttgg ttctgggaat acacactctc      480

cgacgtgacg atcgacagta tcaccgtctc catggacggt cgacgggcaa ctgtg         535
```

<210>   150
<211>   479
<212>   DNA
<213>   Zea mays

<400>   150
```
gccacaggcc gccaccgcct ggcccctcca cctgccgctc cgccagccgc tgggccgacc       60

gcctcttcgc cgacttccac ctcctccccg ccgccgccga cccgccagcc gcggcctcct      120

cttcctcctc gtccccgttc gtcccgatct tccccgaagc cgccgaccgc gccttgcccc      180

tcccggtcga cttctacaag attcttggtg cggagccaca tttcctaggc gatggcattc      240
```
```

```
ggagggcgtt cgagtcgcgg atagctaagc cacctcagta tgggtacagc acagaagctc      300

ttgctgggcg acggcaaatg ctgcagattg cccatgatac tctcacaaac cagagctcgc      360

gcaccgagta cgaccgtgcg ctttccgagg accgtgatgc ggcactcacc atggatgttg      420

cctgggataa ggttccaggt gtgctgcgtg tgcttcagga ggctggggag gcacaactg       479


<210>   151
<211>   446
<212>   DNA
<213>   Zea mays

<400>   151
agcaatgtgg gcaagtgcga cactatagat ctcaaaccat tcaggtggta tgctattcgg       60

tgttttagag aagaaatcca tctgctcagc tgatgtcatc tgcaagaaag cctcattcat      120

gaaggcctca cgagaaaatc ctcctccaac agtagcaata ccacccctgc caacactcca      180

caatatgttt tttgcacctt gcagaccttc ttggcgttta tttttatgtt tttcatcagt      240

aggaagagca agaagctcca atacacaacg aggtgtaatc tcctccaaag tttcatcaat      300

ctgtgcaagc agttcaggtg caagattgct tgcaccatcc tcctgcagga gcttcagtgc      360

cctctcaagc acctcacaac agcagattac atctggaggg cttgctgcca tagcatccct      420

tgatatgtcc acataagcca atgcca                                          446


<210>   152
<211>   657
<212>   DNA
<213>   Zea mays

<400>   152
cgcgtcgacg tatagagtct gcatccatgt tgccttgaat gaagcgtctg caaaagaagg       60

ctcttttatc accagtcgtg tcaggaagca ttttgaaaat atatcaaaat ttctttggct      120

gagtgatagg cctaattcaa atagcaaagg aagtgataaa cacccagcgg ttaatgatat      180

tactgctgca gtttgcaagc aaaagatgga tattcaagaa gcagaaacac ttgtaaaaca      240

gtggcaagac ataaaatctg aagctcttgg ccctgactat caaactgaca tgctacctga      300

gattcttgat ggttcaatgc tctctaagtg ggaagactta gcgttattag caaaggacca      360

gtcttgctat tggagatttg tgctgctaaa tcttaatgtt gttcgagccg agataatctt      420

ggatgaaata ggtgctggtg aggcagcaga aattgatgct gtacttgagg aagcggctga      480
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gcttgttgac gattcccagc ccaagaaacc gagttattac agcacatatg aagttcagta   540

cgtattgagg aggcagaatc atggatcttg gaaaatctcc gaggctgctg tccgggacct   600

gacgtgattt ctgccaactc ggcaaacggg ctacacaacc attggcgtat aggcggc   657

<210> 153
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<212> DNA
<213> Ceratopteris richardii

<400> 153
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cagagagttc tgaggtttac acagttgcgc ttgctcacat agcagaggga tttgttgcaa   180

agaagccgca attgattcag gaagctgatt cactctttct tcagcttcag cgaacaaatg   240

cctcatcatc tagtttgcta gttactggtg gtctacggcc attatcaagt ctgcagcttg   300

attttgcttt tgaacgagcc atgtgcaaac tgctcctagg agaactggat ggttgtcgtg   360

catggctagg tttggatgat acaaactctc catatagaga ccctgcagtg actgattttg   420

ttatagctaa ttcttttgga agtgaggaag gtgattattt accaggcctt tgcaagttgt   480

tggaaagttg gttgagggaa gcggtgtttt tccccaaccc gtcaacagaa aagtggaggt   540

acaagttgag ggagtatttt ttatgatgca aggagaaaaa aagccgccgt gaattttttc   600

gcggggggcg ctatgaaaaa atatattcaa cctttttttg ttggggcgtc gtctacaaag   660

aatgatggag tgtcattgtt gcttttgagg tgacgaaggg gcggcgctcc tctttaaggg   720

atcgtccgtg ggggcgcgcg ctcccatatc gccatcttcg ggacaccttg ttcgtgggtc   780

aaatggtgat gtcttttta ccacgaacgt cacattattc ttataatata agcgtgcggc   840

agcactctca gcttcgacga aacagcctaa a   871

<210> 154
<211> 541
<212> DNA
<213> Physcomitrella patens

<400> 154
gagaacggaa gctttagaag tggaggttgt ccccaaaatg gatgctaggt tggcggaaat   60

tatggttcga agatggcaag cagctaaagc tcgagcactt ggttctgctc atgatatggc   120

ggctcttcct gaggtgctgg agggcgagat gctgaagagc tggacagacc gtgttagtga   180

cgtcaagaga aatggttggt tttgggaata cactctcctt ggtcttcaca ttgatagtgt   240

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aacagtaagt gacgatggga ggcgagcaac tgcggaagcc actttgcaag aggcagcccg    300

cttggtggac cgcaacaacc ctgaccacaa tgattcttat agaagcactt acactacgcg    360

atatgacctc cggcatggca tagatggttg gcgaatcaat ggaggagctg tgctgcgtac    420

ttgattctga gattttcatc tccggatcat gttgacttgt aggcagatcg actagttgca    480

acccttgcat gctacgaatg agtagtcttt ttggatattt tgatccatca tgcagctttg    540

a                                                                     541


<210>   155
<211>   2109
<212>   DNA
<213>   Protochlorococcus marinus MED4

<400>   155
ttggaacttc cattagatca ctttcgttta ataggcgtaa gcccctcagc aacatctgag     60

gaaatattaa gggctttcca attacgcttg ataaaactc ctgatgaagg attcacgtac     120

gaggttttaa ctcaaaggtc ggaattgctt cgccttactg cagatttgct tacagatcca    180

gatagtagaa gagattacga aaatttatta ctaaatggag catcaggttt agatttatct    240

tccaatagag aggttgcagg attaattctc ctttgggaat cgggctcttc taaagaagcc    300

tttaaaataa caagaaaagc attgcaaccc ccccaaactc ctgcattggg tagcagtaga    360

gaagctgatc ttaccttgtt agcggcttta acatctagag atgctgcaat acaagagcaa    420

gatcaaagat cttactcaaa tgctgcagat tttttacaag aaggcataca gcttcttcaa    480

agaatgggca aactagggga attacggaaa actcttgagg aggacttagt gtcgcttctt    540

ccgtatcgaa ttcttgattt gttaagtaga gatctaaatg attatgactc gcataaaaaa    600

ggtttaagta tgctggaaaa tttaataatc aaaagaggtg gattagaagg aaaaaataaa    660

tctgaatata atgattttct aaatcagcaa gaatttgaat ctttctttca acaaataaag    720

ccattcttga ctgttcagga tcagatagat ttatttttag aattacaaaa aaggggttca    780

agtgaagcag gatttttagc ttttttatct ttaacagcaa ttggtttttgc aagaagaaaa    840

cctgcaaaat tattcgaagc tcgaaaaata ttaaaaaaac taaatttatc aggacttgac    900

tcaatgccat aataggttg ccttgatttg cttttagcag atgttgagca atcctcagca    960

aggtttttaa gtagttccga tgagaagtta agagattggt tgaataatta tcctggagaa    1020

aaattagaag caatatgtat tttttgtaaa aattggttag aaaatgatgt tttggttggt    1080

tatagggata ttgatttaaa agaaatcgat ttagactctt ggtttgaaga tagagaaatc    1140

caagaattta ttgagcaaat agaaaagaag tcaaatagaa ctgtgtttaa gtctgggcct    1200
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caaaataaac ctattttca agcccaagaa tctttaaaag attcaagtac gggccctgat    1260

ttaaattcgg ataattttga agaaggccga ttacctttgc ctggaggagt aagagaagat    1320

ggtcaagaag ttattgaaga aaatatttat acagatgaga ttattaaaaa caaatcaata    1380

gaattttata agtacgcaat agaaaaaatt gctgaattaa aatttgtatt tggagaagcc    1440

ttagagaact acagaatatt taataaatct tcctacctaa catatctgta tgctttttg    1500

attttatttg cttttggcct aggtgttgga tttgtaagaa ataatctcaa aaaacccgtg    1560

caggaaaaag aaataattga taactcgtta tcgataaatg aaaataagaa tgtctttat    1620

gaaggtttaa atcaagatga taaaaagaaa gttctcgata actcaaaaat tattctctca    1680

gataatgcag aaaaagttat tttttcaggt gaagaaataa aaactgcttc tccctcctta    1740

gaaaaaatag aaaatttaat taatacatgg cttgttaaca aaagtaaatt tctagcagga    1800

aaaggtgaaa ttaatttatc aaagatagtt caagatgatt tgattgatag attaaagaag    1860

gaaagagaac ttgatattca aaaaggtatc tacaaaaata tcaatgctaa tatcgaaaat    1920

attgtacttt taactcaaac ggcatcaaga atatcagtat cagttgactt aaagtattca    1980

gaaaaaatat taaaaataga tggggaattg ataaatgaaa caactttcac tcctttttg    2040

aaagttaaat atattttagg tttctcaaat aactcctgga aattagttga ctacattagt    2100

ggtgtttag                                                            2109
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<210> 156
<211> 702
<212> PRT
<213> Protochlorococcus marinus MED4

<400> 156

Leu Glu Leu Pro Leu Asp His Phe Arg Leu Ile Gly Val Ser Pro Ser
1   5   10   15

Ala Thr Ser Glu Glu Ile Leu Arg Ala Phe Gln Leu Arg Leu Asp Lys
                20   25   30

Thr Pro Asp Glu Gly Phe Thr Tyr Glu Val Leu Thr Gln Arg Ser Glu
                35   40   45

Leu Leu Arg Leu Thr Ala Asp Leu Leu Thr Asp Pro Asp Ser Arg Arg
        50   55   60

Asp Tyr Glu Asn Leu Leu Leu Asn Gly Ala Ser Gly Leu Asp Leu Ser
65   70   75   80

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Ser Asn Arg Glu Val Ala Gly Leu Ile Leu Leu Trp Glu Ser Gly Ser
                85   90   95

Ser Lys Glu Ala Phe Lys Ile Thr Arg Lys Ala Leu Gln Pro Pro Gln
            100   105   110

Thr Pro Ala Leu Gly Ser Ser Arg Glu Ala Asp Leu Thr Leu Leu Ala
            115   120   125

Ala Leu Thr Ser Arg Asp Ala Ala Ile Gln Glu Gln Asp Gln Arg Ser
    130   135   140

Tyr Ser Asn Ala Ala Asp Phe Leu Gln Glu Gly Ile Gln Leu Leu Gln
145   150   155   160

Arg Met Gly Lys Leu Gly Glu Leu Arg Lys Thr Leu Glu Glu Asp Leu
            165   170   175

Val Ser Leu Leu Pro Tyr Arg Ile Leu Asp Leu Leu Ser Arg Asp Leu
            180   185   190

Asn Asp Tyr Asp Ser His Lys Lys Gly Leu Ser Met Leu Glu Asn Leu
            195   200   205

Ile Ile Lys Arg Gly Gly Leu Glu Gly Lys Asn Lys Ser Glu Tyr Asn
    210   215   220

Asp Phe Leu Asn Gln Gln Glu Phe Glu Ser Phe Phe Gln Gln Ile Lys
225   230   235   240

Pro Phe Leu Thr Val Gln Asp Gln Ile Asp Leu Phe Leu Glu Leu Gln
            245   250   255

Lys Arg Gly Ser Ser Glu Ala Gly Phe Leu Ala Phe Leu Ser Leu Thr
            260   265   270

Ala Ile Gly Phe Ala Arg Arg Lys Pro Ala Lys Leu Phe Glu Ala Arg
    275   280   285

Lys Ile Leu Lys Lys Leu Asn Leu Ser Gly Leu Asp Ser Met Pro Leu
    290   295   300

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Ile Gly Cys Leu Asp Leu Leu Leu Ala Asp Val Glu Gln Ser Ser Ala
305   310   315   320

Arg Phe Leu Ser Ser Ser Asp Glu Lys Leu Arg Asp Trp Leu Asn Asn
            325   330   335

Tyr Pro Gly Glu Lys Leu Glu Ala Ile Cys Ile Phe Cys Lys Asn Trp
        340   345   350

Leu Glu Asn Asp Val Leu Val Gly Tyr Arg Asp Ile Asp Leu Lys Glu
        355   360   365

Ile Asp Leu Asp Ser Trp Phe Glu Asp Arg Glu Ile Gln Glu Phe Ile
    370   375   380

Glu Gln Ile Glu Lys Lys Ser Asn Arg Thr Val Phe Lys Ser Gly Pro
385   390   395   400

Gln Asn Lys Pro Ile Phe Gln Ala Gln Glu Ser Leu Lys Asp Ser Ser
            405   410   415

Thr Gly Pro Asp Leu Asn Ser Asp Asn Phe Glu Glu Gly Arg Leu Pro
            420   425   430

Leu Pro Gly Gly Val Arg Glu Asp Gly Gln Glu Val Ile Glu Glu Asn
        435   440   445

Ile Tyr Thr Asp Glu Ile Ile Lys Asn Lys Ser Ile Glu Phe Tyr Lys
    450   455   460

Tyr Ala Ile Glu Lys Ile Ala Glu Leu Lys Phe Val Phe Gly Glu Ala
465   470   475   480

Leu Glu Asn Tyr Arg Ile Phe Asn Lys Ser Ser Tyr Leu Thr Tyr Leu
            485   490   495

Tyr Ala Phe Leu Ile Leu Phe Ala Phe Gly Leu Gly Val Gly Phe Val
            500   505   510

Arg Asn Asn Leu Lys Lys Pro Val Gln Glu Lys Glu Ile Ile Asp Asn
        515   520   525

Ser Leu Ser Ile Asn Glu Asn Lys Asn Val Phe Tyr Glu Gly Leu Asn
    530   535   540

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Gln Asp Asp Lys Lys Lys Val Leu Asp Asn Ser Lys Ile Ile Leu Ser
545             550             555             560

Asp Asn Ala Glu Lys Val Ile Phe Ser Gly Glu Glu Ile Lys Thr Ala
                565             570             575

Ser Pro Ser Leu Glu Lys Ile Glu Asn Leu Ile Asn Thr Trp Leu Val
            580             585             590

Asn Lys Ser Lys Phe Leu Ala Gly Lys Gly Glu Ile Asn Leu Ser Lys
        595             600             605

Ile Val Gln Asp Asp Leu Ile Asp Arg Leu Lys Lys Glu Arg Glu Leu
        610             615             620

Asp Ile Gln Lys Gly Ile Tyr Lys Asn Ile Asn Ala Asn Ile Glu Asn
625             630             635             640

Ile Val Leu Leu Thr Gln Thr Ala Ser Arg Ile Ser Val Ser Val Asp
            645             650             655

Leu Lys Tyr Ser Glu Lys Ile Leu Lys Ile Asp Gly Glu Leu Ile Asn
            660             665             670

Glu Thr Thr Phe Thr Pro Phe Leu Lys Val Lys Tyr Ile Leu Gly Phe
        675             680             685

Ser Asn Asn Ser Trp Lys Leu Val Asp Tyr Ile Ser Gly Val
    690             695             700
```

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<210>   157
<211>   1986
<212>   DNA
<213>   Protochlorococcus marinus MT9313

<400>   157
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gcgattttgc gggccttgga gttgaggttg gatcgctgcc ctgaccaagg tttcacccat   120

gaggtcttaa ttcagcgggc agaattgttg cggctttcag cagatttgct gactgatccg   180

ccacggcgtc aggcctatga gactgccttg ttggagctca gtcgtgatca tccaggtgag   240

accgccggtc ttgatgtgtc acctagtaga gaggtggcag ggctgatctt gctgtttgaa   300

gcgaattctt ctcatgaggt ttttcatctc gcctctcagg gattgcaacc gccccagtcc   360
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ccgacgctag gtagcgaacg agaagctgac ctcgctttgt tgttggcact ggcctgtcgg       420

gctgcagccg ctgaggaaca ggaacaacgg cgttatgaag cagcagcgtc tcttctgcat       480

gacgggatcc agttgctgca gcggatgggc aagctctccg aagagtgcca caagcttgag       540

aacgatttag atgcccttct gccctatcgc attctcgact tattgagtcg ggatcttggt       600

gatcaggttt ctcaccagga aggactgcgc ctacttgaca actttgtgag ccagagagga       660

ggtcttgagg gaacggcccc atcgcctgca cctggtggtc ttgatcagtc cgaatttgac       720

aacttcttca agcagatcag aaagttttta actgttcagg aacaggttga tcttttcctg       780

cgctggcagc aagccggatc agcagatgcg ggtttcctgg gtgggttggc tcttgctgct       840

gttggatttt cgcgtcggaa gcctgaacgg gtgcaggaag ctcggcagca cttagagagg       900

cttcaactgg atggatgcga cccgttgccg atgctgggtt gcttggacct cttgctcgga       960

gatgtgggcc gcgctcagga gcgttttctg cgcagtacag atcctcgagt gaaggactgt      1020

cttaacagcc accctggcga tgaattggct gctttttgtg agtactgccg ctcttggctg      1080

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atgcctcaag tccctgtcag cgctgtggtt gagccgctta ctttggagca gccgaatgag      1620

gcacagctca aaggcctgct tcaggcctgg ctcagcaaca aggcagtcgt gcttgccggt      1680

ggcaagagtg atgcactgcc tgaggtcgca agagatccat tggtgcagcg cgtggcgcaa      1740

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gtagaggtgg tgagtcgaac gccgcagcgt attgagctga atgccgttgt gacctatcgc      1860

gatcaacgcg ttgatgctgc cggcaaggtt gttgaccaaa cgccccaaaa agatctctcg      1920

gtgacttaca tccttggtcg tgatcccgat cgttggcgcc tgcatgaata catcagcggc      1980

aaataa                                                                 1986
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<210> 158
<211> 661
<212> PRT
<213> Protochlorococcus marinus MT9313

<400> 158

Val Asp Leu Pro Ile Asp His Phe Arg Leu Leu Gly Val Ser Pro Ser
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Ala Asp Ser Glu Ala Ile Leu Arg Ala Leu Glu Leu Arg Leu Asp Arg
            20   25   30

Cys Pro Asp Gln Gly Phe Thr His Glu Val Leu Ile Gln Arg Ala Glu
        35   40   45

Leu Leu Arg Leu Ser Ala Asp Leu Leu Thr Asp Pro Pro Arg Arg Gln
    50   55   60

Ala Tyr Glu Thr Ala Leu Leu Glu Leu Ser Arg Asp His Pro Gly Glu
65   70   75   80

Thr Ala Gly Leu Asp Val Ser Pro Ser Arg Glu Val Ala Gly Leu Ile
            85   90   95

Leu Leu Phe Glu Ala Asn Ser Ser His Glu Val Phe His Leu Ala Ser
        100   105   110

Gln Gly Leu Gln Pro Pro Gln Ser Pro Thr Leu Gly Ser Glu Arg Glu
        115   120   125

Ala Asp Leu Ala Leu Leu Leu Ala Leu Ala Cys Arg Ala Ala Ala Ala
    130   135   140

Glu Glu Gln Glu Gln Arg Arg Tyr Glu Ala Ala Ala Ser Leu Leu His
145   150   155   160

Asp Gly Ile Gln Leu Leu Gln Arg Met Gly Lys Leu Ser Glu Glu Cys
            165   170   175

His Lys Leu Glu Asn Asp Leu Asp Ala Leu Leu Pro Tyr Arg Ile Leu
        180   185   190

Asp Leu Leu Ser Arg Asp Leu Gly Asp Gln Val Ser His Gln Glu Gly
    195   200   205

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Leu Arg Leu Leu Asp Asn Phe Val Ser Gln Arg Gly Gly Leu Glu Gly
    210   215   220

Thr Ala Pro Ser Pro Ala Pro Gly Gly Leu Asp Gln Ser Glu Phe Asp
225   230   235   240

Asn Phe Phe Lys Gln Ile Arg Lys Phe Leu Thr Val Gln Glu Gln Val
            245   250   255

Asp Leu Phe Leu Arg Trp Gln Gln Ala Gly Ser Ala Asp Ala Gly Phe
            260   265   270

Leu Gly Gly Leu Ala Leu Ala Ala Val Gly Phe Ser Arg Arg Lys Pro
            275   280   285

Glu Arg Val Gln Glu Ala Arg Gln His Leu Glu Arg Leu Gln Leu Asp
    290   295   300

Gly Cys Asp Pro Leu Pro Met Leu Gly Cys Leu Asp Leu Leu Leu Gly
305   310   315   320

Asp Val Gly Arg Ala Gln Glu Arg Phe Leu Arg Ser Thr Asp Pro Arg
            325   330   335

Val Lys Asp Cys Leu Asn Ser His Pro Gly Asp Glu Leu Ala Ala Phe
            340   345   350

Cys Glu Tyr Cys Arg Ser Trp Leu Arg Gly Asp Val Leu Pro Gly Tyr
            355   360   365

Arg Asp Val Asp Ala Glu Ala Val Asp Leu Glu Ala Trp Phe Ala Asp
    370   375   380

Arg Asp Val Gln Ala Tyr Val Glu Arg Leu Glu Arg Ser Glu Asn Arg
385   390   395   400

Ala Ser Ser Leu Gly Lys Ala Phe Ser Gly Ser Ser Val Lys Gln Pro
            405   410   415

Phe Pro Trp Ala Pro Leu Asp Pro Asp Gly Ile Leu Pro Leu Ser Leu
            420   425   430

Gly Gly Pro Asp Val Gly Gln Pro Ala Ala Asp Gln Ser Ser Asp Glu
            435   440   445

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Phe Ala Ser Asp Gly Met Ala Trp Ile Asp Arg Leu Ala Asp Leu Pro
    450             455             460

Arg Pro Thr Arg Pro Val Leu Ile Gly Ser Val Val Phe Ala Ala Leu
465             470             475             480

Ile Ala Ala Phe Ala Gly Phe Ser Leu Phe Gly Gln Arg Pro Arg Thr
            485             490             495

Ser Val Ser Thr Ala Ala Asp Gln Pro Gln Val Thr Ala Pro Pro Thr
            500             505             510

Ala Thr Leu Gln Glu Glu Val Leu Met Pro Gln Val Pro Val Ser Ala
        515             520             525

Val Val Glu Pro Leu Thr Leu Glu Gln Pro Asn Glu Ala Gln Leu Lys
    530             535             540

Gly Leu Leu Gln Ala Trp Leu Ser Asn Lys Ala Val Val Leu Ala Gly
545             550             555             560

Gly Lys Ser Asp Ala Leu Pro Glu Val Ala Arg Asp Pro Leu Val Gln
            565             570             575

Arg Val Ala Gln Glu Arg Ala Arg Asp Ala Ala Leu Ala Gln Thr Gln
            580             585             590

Lys Val Val Ala Ser Ile Ser Ser Val Glu Val Val Ser Arg Thr Pro
    595             600             605

Gln Arg Ile Glu Leu Asn Ala Val Val Thr Tyr Arg Asp Gln Arg Val
    610             615             620

Asp Ala Ala Gly Lys Val Val Asp Gln Thr Pro Gln Lys Asp Leu Ser
625             630             635             640

Val Thr Tyr Ile Leu Gly Arg Asp Pro Asp Arg Trp Arg Leu His Glu
            645             650             655

Tyr Ile Ser Gly Lys
            660
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<210> 159
<211> 2151
<212> DNA
<213> Synechococcus PCC7002

<400> 159
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gtgcgcattc cgctcgacta ttaccgcatc ctatgcgtcc ccgccaaggc aaccactgcc      60

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ttggccattg aggcccgcaa ccggattatc gagcaagcct ttgaggtgtt atcccaaaca     180

gaaacccgcg ccgtctacga ccatgagctg tcgggcaata tgtttcgttc cctcgtcccc     240

agccgtccga aactgccttt tcccgatcgc ccctccagtg acacagagtt agaagccctg     300

acagcccacc aaccaaccat tgacatcgcg gaaaaagatt tactgggggg actgctgtta     360

ctcctcgacc tggggggagta cgaattagtg ctgaagtggg ctgcccccta cctcaagggc     420

aaaggcaagc tggtcaagga agggaaattt ggggccgtcg aaatcgtcga gcaagaacta     480

cggctttgtt tggccctggc ccactgggaa ttgagccggg aacagtggct ccaacaacat     540

tatgaacagg cggctctctc cggtcagaag agtcaagagc tattggtaga tgtggcacaa     600

tttgcagacc tccaacagga aattcaaggg gatctcaatc gcctcagacc ctatcaagtt     660

ctagaacttc tggccctacc cgaatcagaa acccaagagc gacaacgggg cttacaactg     720

ctccaggaaa tgttgagtgc tcgcgtgggg attgatggcc aggggacga tcagtcgggt     780

ctaagtattg atgatttttt gcgctttatc cagcagttac gcagttatct aacggtgcaa     840

gaacagttgg atctctttgt ggcagaatca aagcgacctt cggcggcagc ggcctaccta     900

gcggtgtatg ctctcttggc tgctgggttt tcgcaacgga aacctgacct ggtcgtgcaa     960

gcccagaccc tattaaaacg cctcggcaaa cgccaggatg ttttcttgga gcaatcaatc    1020

tgcgccttac ttttaggtca gccgtcggaa gccaatcaac tgttagaaca aagtcaggaa    1080

caggaggcga tcgcctacat tcaagagcag tctgaggggg caccggatct actcccaggc    1140

ctatgtctct acggggaaca gtggctgaag acagaggttt tttcccattt ccgcgatctc    1200

cggcaacggc ttgaagatgg ctctgtttcg ttgacggctt acttcgccga tcctgaagtg    1260

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gtttcgccgc atcccagtcg tcccgccaag gttgattcct ttgaggatct cgtcactcaa    1440

actcccgcta cagttccccc ggcaccgcct tctcctggtg tagcacctgt aactgcggca    1500

ttaaacccag acccggaagc gtcttctgct tcgtcaaaat cagtttcgtc aaaaaagtct    1560
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atcgggcctt ggggggcgat cgccgctatc gtggggagtg ttttgctggt cgtgggcctg    1620

gtgcgaattt tgtctggcct aactacccag gaacccttac aggtcaccct caacggtgag    1680

ccacccctaa cgatccccag cttagacacc gccgaggcaa ataataatcc ggagaatgga    1740

gcgaccgata caacgacaac gcctgcgctc aatgaggcga tcgccgctga ggtgattcaa    1800

acttggtttg agagtaaagc tagagccttt ggccaagacc gtgatttggc ggctctagaa    1860

aatattttgg cagaaccgtc cctgtcccgc tggcgcagta gtgcccaggc cgtccgcagc    1920

gctggtacct accgcaccta tgaccacagt ttgaccattg aaacggtgag cttcaaccca    1980

gaccaaccca atgtggcgac cgttgaggcc caggtgcagg aaaaggcaga ttattaccgg    2040

gcgaatgggg aacgcgatcc cggccagtcc tatgattctg acctgcgtgt ccgctacagc    2100

ttggtgcgcc aaggcgatcg ctggttgatt cgttcttccc aaaccctgta a           2151
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<210> 160
<211> 716
<212> PRT
<213> Synechococcus PCC7002

<400> 160

Met Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Cys Val Pro Ala Lys
1   5   10   15

Ala Thr Thr Ala Gln Ile Thr Gln Ala Tyr Arg Asp Arg Leu Ser Gln
            20   25   30

Phe Pro Arg Arg Glu His Asn Ala Leu Ala Ile Glu Ala Arg Asn Arg
        35   40   45

Ile Ile Glu Gln Ala Phe Glu Val Leu Ser Gln Thr Glu Thr Arg Ala
    50   55   60

Val Tyr Asp His Glu Leu Ser Gly Asn Met Phe Arg Ser Leu Val Pro
65   70   75   80

Ser Arg Pro Lys Leu Pro Phe Pro Asp Arg Pro Ser Ser Asp Thr Glu
                85   90   95

Leu Glu Ala Leu Thr Ala His Gln Pro Thr Ile Asp Ile Ala Glu Lys
                100   105   110

Asp Leu Leu Gly Gly Leu Leu Leu Leu Asp Leu Gly Glu Tyr Glu
        115   120   125

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```
Leu Val Leu Lys Trp Ala Ala Pro Tyr Leu Lys Gly Lys Gly Lys Leu
    130             135             140

Val Lys Glu Gly Lys Phe Gly Ala Val Glu Ile Val Glu Gln Glu Leu
145             150             155             160

Arg Leu Cys Leu Ala Leu Ala His Trp Glu Leu Ser Arg Glu Gln Trp
            165             170             175

Leu Gln Gln His Tyr Glu Gln Ala Ala Leu Ser Gly Gln Lys Ser Gln
            180             185             190

Glu Leu Leu Val Asp Val Ala Gln Phe Ala Asp Leu Gln Gln Glu Ile
        195             200             205

Gln Gly Asp Leu Asn Arg Leu Arg Pro Tyr Gln Val Leu Glu Leu Leu
    210             215             220

Ala Leu Pro Glu Ser Glu Thr Gln Glu Arg Gln Arg Gly Leu Gln Leu
225             230             235             240

Leu Gln Glu Met Leu Ser Ala Arg Val Gly Ile Asp Gly Gln Gly Asp
            245             250             255

Asp Gln Ser Gly Leu Ser Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln
            260             265             270

Leu Arg Ser Tyr Leu Thr Val Gln Glu Gln Leu Asp Leu Phe Val Ala
        275             280             285

Glu Ser Lys Arg Pro Ser Ala Ala Ala Tyr Leu Ala Val Tyr Ala
    290             295             300

Leu Leu Ala Ala Gly Phe Ser Gln Arg Lys Pro Asp Leu Val Val Gln
305             310             315             320

Ala Gln Thr Leu Leu Lys Arg Leu Gly Lys Arg Gln Asp Val Phe Leu
        325             330             335
```

Glu Gln Ser Ile Cys Ala Leu Leu Leu Gly Gln Pro Ser Glu Ala Asn
        340   345   350

Gln Leu Leu Glu Gln Ser Gln Glu Gln Glu Ala Ile Ala Tyr Ile Gln
        355   360   365

Glu Gln Ser Glu Gly Ala Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr
        370   375   380

Gly Glu Gln Trp Leu Lys Thr Glu Val Phe Ser His Phe Arg Asp Leu
385   390   395   400

Arg Gln Arg Leu Glu Asp Gly Ser Val Ser Leu Thr Ala Tyr Phe Ala
                405   410   415

Asp Pro Glu Val Gln Gln Tyr Leu Asp Asp Leu Leu Thr Glu Ala Val
            420   425   430

Pro Thr Pro Thr Pro His Pro Asp Thr Glu Ser Thr Ala Ala Pro Ser
        435   440   445

Glu Lys Pro Pro Glu Thr Leu Gln Ser Glu Thr Gly Val Ser Pro His
        450   455   460

Pro Ser Arg Pro Ala Lys Val Asp Ser Phe Glu Asp Leu Val Thr Gln
465   470   475   480

Thr Pro Ala Thr Val Pro Pro Ala Pro Pro Ser Pro Gly Val Ala Pro
            485   490   495

Val Thr Ala Ala Leu Asn Pro Asp Pro Glu Ala Ser Ser Ala Ser Ser
        500   505   510

Lys Ser Val Ser Ser Lys Lys Ser Ile Gly Pro Trp Gly Ala Ile Ala
        515   520   525

Ala Ile Val Gly Ser Val Leu Leu Val Val Gly Leu Val Arg Ile Leu
        530   535   540

Ser Gly Leu Thr Thr Gln Glu Pro Leu Gln Val Thr Leu Asn Gly Glu
545   550   555   560

Pro Pro Leu Thr Ile Pro Ser Leu Asp Thr Ala Glu Ala Asn Asn Asn
            565   570   575

Pro Glu Asn Gly Ala Thr Asp Thr Thr Thr Thr Pro Ala Leu Asn Glu
            580   585   590

Ala Ile Ala Ala Glu Val Ile Gln Thr Trp Phe Glu Ser Lys Ala Arg
            595   600   605

Ala Phe Gly Gln Asp Arg Asp Leu Ala Ala Leu Glu Asn Ile Leu Ala
            610   615   620

Glu Pro Ser Leu Ser Arg Trp Arg Ser Ser Ala Gln Ala Val Arg Ser
625   630   635   640

Ala Gly Thr Tyr Arg Thr Tyr Asp His Ser Leu Thr Ile Glu Thr Val
            645   650   655

Ser Phe Asn Pro Asp Gln Pro Asn Val Ala Thr Val Glu Ala Gln Val
            660   665   670

Gln Glu Lys Ala Asp Tyr Tyr Arg Ala Asn Gly Glu Arg Asp Pro Gly
            675   680   685

Gln Ser Tyr Asp Ser Asp Leu Arg Val Arg Tyr Ser Leu Val Arg Gln
            690   695   700

Gly Asp Arg Trp Leu Ile Arg Ser Ser Gln Thr Leu
705   710   715

<210>   161
<211>   2469
<212>   DNA
<213>   Synechococcus PCC7942

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tgtgccggtt aacaccagtc tgtcgctgac agcggtgcct ttctggggct tgcctgtggg   120

gcgagtaacc gatcgctggg ataagagttg gtgcttctgg ctctcaagaa tagggttttc   180

cgtcgcgtat tcccgatcac atccccctgt gtctgctacg gagataacgc cgatcactca   240

acagaattgg taagttgacg gtcaagttgg gatgatgaag tcggctcaag ctggcgatcc   300

ggatctggtg ggtgttctgt gcgtattcct ctcgattact accgaattct ctgtgttggc   360

```
gtgcaagcct cggcagacaa acttgccgaa agctaccgcg atcgcctcaa ccaatcgccc      420

tcccatgagt tttcagagct ggcattgcag gcgcggcggc aactcctcga agcagcgatt      480

gctgagctga gtgatcccga acagcgcgat cgctacgatc gccgcttttt tcagggcggt      540

ctggaagcga ttgaaccaag cctagaactc gaagactggc agcgaattgg agccctgctg      600

atcctgctgg aattggggga atacgatcgc gtttcgcaac tggctgagga actcctgcca      660

gactacgacg cgagcgcaga agtacgcgat cagttcgcgc ggggtgatat cgccttggcg      720

atcgcactat cccagcaatc cctcggtcga gaatgccgtc agcagggtct gtacgaacag      780

gccgcccagc actttggccg cagccagtct gccctagccg atcatcagcg ctttcctgaa      840

ctgagtcgaa ccctgcacca agaacaagga cagctacggc cctatcgcat tttggagcgg      900

ttggcccagc ccttgactgc cgatagcgat cgccagcagg gtttgctgtt gttgcaggcg      960

atgttggacg accggcaggg cattgaaggc cctggggatg atggctcggg gctgaccctt     1020

gataactttt tgatgtttct ccagcaaatt cgcggctatc tgaccctggc tgaacagcag     1080

ttgctgtttg aatcggaagc gcgtcggccc tcgccggctg cgagcttttt tgcctgctac     1140

accctgattg cgcggggctt ttgcgatcac caaccctcgt tgatccatcg cgccagcttg     1200

ctcttgcatg aactcaagag ccgcatggat gtgcacatcg aacaggcgat cgccagccta     1260

ttgctcggac agcccgaaga agctgaggcg ctactcgtcc agagccaaga tgaggaaacc     1320

ctcagccaaa tccgtgccct agcccaaggg gaagccctga tcgtcggttt gtgccgattc     1380

acggaaacct ggctagcgac caaggtattt ccggatttcc gcgacctcaa ggaaaggact     1440

gcgccgctgc agccctactt tgacgacccc gatgtccaga cctatctgga tgcgatcgtg     1500

gagttgccgt ccgatttgat gccaacgccg ctacccgttg agccgcttga ggtgcgatcg     1560

tcgttgctgg ccaaggaact gccgacccca gcaacgcctg gtgtagctcc accccctcgc     1620

cgccgtcgcc gcgatcgctc cgaacgtcct gctcgcacgg ccaaacgctt gcccttgccc     1680

tggattggtt tgggggttgt ggtggttctc ggcggtggaa caggggtttg ggcttggcga     1740

tcgcgttcca attccacccc gccgaccccg cccccgtgg ttcaaacgct gcctgaggcg     1800

gtacctgccc cttcgcccgc gccagttacc gttgccctcg atcgggctca ggctgaaact     1860

gtgttgcaaa actggttggc cgctaaagct gcagccttgg ggcctcaata cgatcgcgat     1920

cgcttagcga cggtgctgac cggtgaggtt ctgcagactt ggcagggttt ttctagccag     1980

caggccaaca cccagctcac atcacagttc gatcacaagt taaccgtcga ctcagttcag     2040

ctcagtgacg gtgatcaacg agcagtagtc caagccaagg tcgatgaagt tgagcaggtc     2100
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tatcgaggcg accagctgct cgaaacgcgc cgagatttgg gcttggtgat ccgctaccag    2160

ctcgtgcgcg agaacaacat ctggaaaatt gcttcgatta gtttggtgcg ctaggaattc    2220

gcaaggggtg aaccccctgc ggtcttttct gtagatcccc tagagcgatc gcagaatgtt    2280

cagcgattcc tggatgtgcg cttgggcatt caagagtgaa tcaaaaatgt ggcgcacctt    2340

gccctctttg tcgatcacat aagtgacgcg acccggaatc acaaacaggg ttttgggcac    2400

gccataggtt tgacggaggc gatcgcctgc atcgctcagc agttggaagg gcaagttgta    2460

tttctgggc                                                            2469
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<210> 162
<211> 631
<212> PRT
<213> Synechococcus PCC7942

<400> 162

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Met Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Cys Val Gly Val Gln
1               5                   10                  15


Ala Ser Ala Asp Lys Leu Ala Glu Ser Tyr Arg Asp Arg Leu Asn Gln
                20                  25                  30


Ser Pro Ser His Glu Phe Ser Glu Leu Ala Leu Gln Ala Arg Arg Gln
                35                  40                  45


Leu Leu Glu Ala Ala Ile Ala Glu Leu Ser Asp Pro Glu Gln Arg Asp
        50                  55                  60


Arg Tyr Asp Arg Arg Phe Phe Gln Gly Gly Leu Glu Ala Ile Glu Pro
65                  70                  75                  80


Ser Leu Glu Leu Glu Asp Trp Gln Arg Ile Gly Ala Leu Leu Ile Leu
                85                  90                  95


Leu Glu Leu Gly Glu Tyr Asp Arg Val Ser Gln Leu Ala Glu Glu Leu
                100                 105                 110


Leu Pro Asp Tyr Asp Ala Ser Ala Glu Val Arg Asp Gln Phe Ala Arg
            115                 120                 125


Gly Asp Ile Ala Leu Ala Ile Ala Leu Ser Gln Gln Ser Leu Gly Arg
        130                 135                 140
```

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Glu Cys Arg Gln Gln Gly Leu Tyr Glu Gln Ala Ala Gln His Phe Gly
145   150   155   160

Arg Ser Gln Ser Ala Leu Ala Asp His Gln Arg Phe Pro Glu Leu Ser
            165   170   175

Arg Thr Leu His Gln Glu Gln Gly Gln Leu Arg Pro Tyr Arg Ile Leu
            180   185   190

Glu Arg Leu Ala Gln Pro Leu Thr Ala Asp Ser Asp Arg Gln Gln Gly
        195   200   205

Leu Leu Leu Leu Gln Ala Met Leu Asp Asp Arg Gln Gly Ile Glu Gly
    210   215   220

Pro Gly Asp Asp Gly Ser Gly Leu Thr Leu Asp Asn Phe Leu Met Phe
225   230   235   240

Leu Gln Gln Ile Arg Gly Tyr Leu Thr Leu Ala Glu Gln Gln Leu Leu
            245   250   255

Phe Glu Ser Glu Ala Arg Arg Pro Ser Pro Ala Ala Ser Phe Phe Ala
            260   265   270

Cys Tyr Thr Leu Ile Ala Arg Gly Phe Cys Asp His Gln Pro Ser Leu
        275   280   285

Ile His Arg Ala Ser Leu Leu Leu His Glu Leu Lys Ser Arg Met Asp
    290   295   300

Val His Ile Glu Gln Ala Ile Ala Ser Leu Leu Leu Gly Gln Pro Glu
305   310   315   320

Glu Ala Glu Ala Leu Leu Val Gln Ser Gln Asp Glu Glu Thr Leu Ser
            325   330   335

Gln Ile Arg Ala Leu Ala Gln Gly Glu Ala Leu Ile Val Gly Leu Cys
            340   345   350

Arg Phe Thr Glu Thr Trp Leu Ala Thr Lys Val Phe Pro Asp Phe Arg
        355   360   365

Asp Leu Lys Glu Arg Thr Ala Pro Leu Gln Pro Tyr Phe Asp Asp Pro
    370   375   380

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Asp Val Gln Thr Tyr Leu Asp Ala Ile Val Glu Leu Pro Ser Asp Leu
385   390   395   400

Met Pro Thr Pro Leu Pro Val Glu Pro Leu Glu Val Arg Ser Ser Leu
                405   410   415

Leu Ala Lys Glu Leu Pro Thr Pro Ala Thr Pro Gly Val Ala Pro Pro
            420   425   430

Pro Arg Arg Arg Arg Arg Asp Arg Ser Glu Arg Pro Ala Arg Thr Ala
        435   .   440   445

Lys Arg Leu Pro Leu Pro Trp Ile Gly Leu Gly Val Val Val Val Leu
    450   455   460

Gly Gly Gly Thr Gly Val Trp Ala Trp Arg Ser Arg Ser Asn Ser Thr
465   470   475   480

Pro Pro Thr Pro Pro Pro Val Val Gln Thr Leu Pro Glu Ala Val Pro
            485   490   495

Ala Pro Ser Pro Ala Pro Val Thr Val Ala Leu Asp Arg Ala Gln Ala
            500   505   510

Glu Thr Val Leu Gln Asn Trp Leu Ala Ala Lys Ala Ala Ala Leu Gly
        515   520   525

Pro Gln Tyr Asp Arg Asp Arg Leu Ala Thr Val Leu Thr Gly Glu Val
    530   535   540

Leu Gln Thr Trp Gln Gly Phe Ser Ser Gln Gln Ala Asn Thr Gln Leu
545   550   555   560

Thr Ser Gln Phe Asp His Lys Leu Thr Val Asp Ser Val Gln Leu Ser
            565   570   575

Asp Gly Asp Gln Arg Ala Val Val Gln Ala Lys Val Asp Glu Val Glu
            580   585   .   590

Gln Val Tyr Arg Gly Asp Gln Leu Leu Glu Thr Arg Arg Asp Leu Gly
    595   600   605

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Leu Val Ile Arg Tyr Gln Leu Val Arg Glu Asn Asn Ile Trp Lys Ile
   610   615   620

Ala Ser Ile Ser Leu Val Arg
625   630

<210>   163
<211>   2400
<212>   DNA
<213>   Anabaena PCC7120

<400>   163
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attgtccaat tgccgcgacg ggagtattct caagcagcaa ttgcttcccg taaacaactt   180

atagaagaag cttacgtggt tttatcagat ccaaaggaac gcagcagtta tgaccagctg   240

tatcttgctc acgcctacga cccagacaac gcggctacaa ccaaagtggc agtggaaaat   300

cgtggggaca gcaacaatgg tcatttcgat gtccaaagcc tgagcatcga gtttcctcc   360

gaggaattaa ttggtgcttt attaattttg caagagttgg gagagtatga actcgtactc   420

aagttaggtc gtaattactt aggtaatcaa aacggcacag catccaccag aaatggcaat   480

catcgcacgc ctgaagaatt tctcgatagt tctgaacgtc cagatattct cttgactgtt   540

gctttggcct cattagaatt agggcgggaa caatggcaac aaggccacta tgaaaacgct   600

gctttgtctt tagagactgg gcaagaagtg ctgtttagtg aaggcatctt ccccagcgtc   660

caggcagaaa ttcaggctga tctttacaaa ttacgccctt atagaatttt agaattactt   720

gccttacccc aggaaaaaac cattgaacgc caccaagggc tggatctatt acaaagcatc   780

ttagacgatc gcggtggcat tgatggtaca ggcaatgatc aatcaggctt aaacattgat   840

gacttcctcc gattcatcca gcaattacgc caccacttaa cagtggctga caacataag   900

ttgtttgatg gtgaaagcaa acgcccttcg gctgtggcta catacttagc tgtttatgct   960

tccatcgcca gaggattcac ccaacgccag cccgctttaa ttcgtcatgc caagcaaatt   1020

ctgatgcgtt tgtctaagcg gcaagatgtg catttagagc agtccctgtg tgcgctatta   1080

ctagggcaaa ctgaagaagc cacgcgagtt ttagaactga gccaagaata cgaagcttta   1140

gccttaattc gagaaaaatc tcaagattca cccgatttac tgccaggttt gtgcttatat   1200

gccgaacaat ggctgcaaaa tgaagttttc ccccatttcc gcgatttgtc cagacagcaa   1260

gcttccctga aagattactt tgctaatcaa caagtacaag cgtatttaga agccttgccc   1320

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aacgacgcgg aaaccactaa tgaatgggct gtaattaacc gccaatcgtt ttctcaaccc    1380

aggggcaatt cttactctgg aggaacgcca gtcgccaaac gtcccgtagg gaaggcgaac    1440

aggccaggag aagcgtccac aagaccagtt ccccaacgta gtcatccatc agaagtaaat    1500

cggcagtttc atcaaaacag aacccctgat cccgaattac cagaaacatc aaaccacaga    1560

agaccagagt cttcaaattt tacaactgct agagaaaata tatcgaccac agatgcttac    1620

actgacaatt atccaccaga gatccctgta gaacgcgcca gcagacctgt tcagccgggg    1680

gtaagtggtt atacccaatc gacccctcca cggcaaactc ctaaacgcag gagacgcaag    1740

aagccacagg cagttgtcaa cagaggacac agtattcatc agcaacgcca accctcacct    1800

agcactctag gccggaaaac aagattactt tggatagttt tgggttcttt gggtgggata    1860

ttattgttct ggctgatagt ctcaacgact tttgggtggt taaagaatgt attcttccca    1920

gcaccatctt tacaaggtga gcaattatcg attcagatta gtcaaccacc tttagagatt    1980

cctgacaaaa atgcccagat acaatcccca gaggtgagtc tcacagaaga aacggcaagg    2040

aaaataattg aaaattggtt ggctaccaaa gctagtgctt taggcgctga acataaaatt    2100

gagagtttaa acgagatttt aactggttca gcgttatctc aatggcggct aattgccttg    2160

caagataaag cagacaatcg tcatcgagaa tacagtcata gtgtcaaggt agactccatc    2220

agtaaatctg acatagatcc caatcgtgca agtgtggggg ctacagtcag agagttaacc    2280

caattttatg agaatgggca aaaagggaag tcttctgacg aaagattacg tgtacgctat    2340

gaattgattc gacaagatga tatttggcgg attcagagga tgtcagccgc tataaattaa    2400
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<210>   164
<211>   798
<212>   PRT
<213>   Anabaena PCC7120

<400>   164

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Met Leu Ile Thr Val Gln Gly Lys Tyr Ala Val Arg Ile Pro Leu Asp
1               5                   10                  15


Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln Leu
            20                  25                  30


Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu Tyr
        35                  40                  45


Ser Gln Ala Ala Ile Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala Tyr
    50                  55                  60
```

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Val Val Leu Ser Asp Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu Tyr
65   70   75   80

Leu Ala His Ala Tyr Asp Pro Asp Asn Ala Ala Thr Thr Lys Val Ala
            85   90   95

Val Glu Asn Arg Gly Asp Ser Asn Asn Gly His Phe Asp Val Gln Ser
            100   105   110

Leu Ser Ile Glu Val Ser Ser Glu Glu Leu Ile Gly Ala Leu Leu Ile
            115   120   125

Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val Leu Lys Leu Gly Arg Asn
    130   135   140

Tyr Leu Gly Asn Gln Asn Gly Thr Ala Ser Thr Arg Asn Gly Asn His
145   150   155   160

Arg Thr Pro Glu Glu Phe Leu Asp Ser Ser Glu Arg Pro Asp Ile Leu
            165   170   175

Leu Thr Val Ala Leu Ala Ser Leu Glu Leu Gly Arg Glu Gln Trp Gln
            180   185   190

Gln Gly His Tyr Glu Asn Ala Ala Leu Ser Leu Glu Thr Gly Gln Glu
            195   200   205

Val Leu Phe Ser Glu Gly Ile Phe Pro Ser Val Gln Ala Glu Ile Gln
    210   215   220

Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala
225   230   235   240

Leu Pro Gln Glu Lys Thr Ile Glu Arg His Gln Gly Leu Asp Leu Leu
            245   250   255

Gln Ser Ile Leu Asp Asp Arg Gly Gly Ile Asp Gly Thr Gly Asn Asp
            260   265   270

Gln Ser Gly Leu Asn Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln Leu
            275   280   285

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Arg His His Leu Thr Val Ala Glu Gln His Lys Leu Phe Asp Gly Glu
    290   295   300

Ser Lys Arg Pro Ser Ala Val Ala Thr Tyr Leu Ala Val Tyr Ala Ser
305   310   315   320

Ile Ala Arg Gly Phe Thr Gln Arg Gln Pro Ala Leu Ile Arg His Ala
                325   330   335

Lys Gln Ile Leu Met Arg Leu Ser Lys Arg Gln Asp Val His Leu Glu
            340   345   350

Gln Ser Leu Cys Ala Leu Leu Leu Gly Gln Thr Glu Glu Ala Thr Arg
        355   360   365

Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala Leu Ala Leu Ile Arg Glu
    370   375   380

Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr Ala
385   390   395   400

Glu Gln Trp Leu Gln Asn Glu Val Phe Pro His Phe Arg Asp Leu Ser
            405   410   415

Arg Gln Gln Ala Ser Leu Lys Asp Tyr Phe Ala Asn Gln Gln Val Gln
            420   425   430

Ala Tyr Leu Glu Ala Leu Pro Asn Asp Ala Glu Thr Thr Asn Glu Trp
    435   440   445

Ala Val Ile Asn Arg Gln Ser Phe Ser Gln Pro Arg Gly Asn Ser Tyr
    450   455   460

Ser Gly Gly Thr Pro Val Ala Lys Arg Pro Val Gly Lys Ala Asn Arg
465   470   475   480

Pro Gly Glu Ala Ser Thr Arg Pro Val Pro Gln Arg Ser His Pro Ser
            485   490   495

Glu Val Asn Arg Gln Phe His Gln Asn Arg Thr Pro Asp Pro Glu Leu
            500 ·   505   510

Pro Glu Thr Ser Asn His Arg Arg Pro Glu Ser Ser Asn Phe Thr Thr
        515   520   525

```
Ala Arg Glu Asn Ile Ser Thr Thr Asp Ala Tyr Thr Asp Asn Tyr Pro
    530             535             540

Pro Glu Ile Pro Val Glu Arg Ala Ser Arg Pro Val Gln Pro Gly Val
545             550             555             560

Ser Gly Tyr Thr Gln Ser Thr Pro Pro Arg Gln Thr Pro Lys Arg Arg
            565             570             575

Arg Arg Lys Lys Pro Gln Ala Val Val Asn Arg Gly His Ser Ile His
            580             585             590

Gln Gln Arg Gln Pro Ser Pro Ser Thr Leu Gly Arg Lys Thr Arg Leu
            595             600             605

Leu Trp Ile Val Leu Gly Ser Leu Gly Gly Ile Leu Leu Phe Trp Leu
    610             615             620

Ile Val Ser Thr Thr Phe Gly Trp Leu Lys Asn Val Phe Phe Pro Ala
625             630             635             640

Pro Ser Leu Gln Gly Glu Gln Leu Ser Ile Gln Ile Ser Gln Pro Pro
            645             650             655

Leu Glu Ile Pro Asp Lys Asn Ala Gln Ile Gln Ser Pro Glu Val Ser
            660             665             670

Leu Thr Glu Glu Thr Ala Arg Lys Ile Ile Glu Asn Trp Leu Ala Thr
            675             680             685

Lys Ala Ser Ala Leu Gly Ala Glu His Lys Ile Glu Ser Leu Asn Glu
    690             695             700

Ile Leu Thr Gly Ser Ala Leu Ser Gln Trp Arg Leu Ile Ala Leu Gln
705             710             715             720

Asp Lys Ala Asp Asn Arg His Arg Glu Tyr Ser His Ser Val Lys Val
            725             730             735

Asp Ser Ile Ser Lys Ser Asp Ile Asp Pro Asn Arg Ala Ser Val Gly
            740             745             750
```

-170-

Ala Thr Val Arg Glu Leu Thr Gln Phe Tyr Glu Asn Gly Gln Lys Gly
        755   .760   765

Lys Ser Ser Asp Glu Arg Leu Arg Val Arg Tyr Glu Leu Ile Arg Gln
        770   775   780

Asp Asp Ile Trp Arg Ile Gln Arg Met Ser Ala Ala Ile Asn
785   790   795

<210> 165
<211> 798
<212> PRT
<213> Anabaena PCC7120

<400> 165

Met Leu Ile Thr Val Gln Gly Lys Tyr Ala Val Arg Ile Pro Leu Asp
1   5   10   15

Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln Leu
            20   25   30

Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu Tyr
        35   40   45

Ser Gln Ala Ala Ile Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala Tyr
        50   55   60

Val Val Leu Ser Asp Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu Tyr
65   70   75   80

Leu Ala His Ala Tyr Asp Pro Asp Asn Ala Ala Thr Thr Lys Val Ala
            85   90   95

Val Glu Asn Arg Gly Asp Ser Asn Asn Gly His Phe Asp Val Gln Ser
            100   105   110

Leu Ser Ile Glu Val Ser Ser Glu Glu Leu Ile Gly Ala Leu Leu Ile
        115   120   125

Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val Leu Lys Leu Gly Arg Asn
        130   135   140

Tyr Leu Gly Asn Gln Asn Gly Thr Ala Ser Thr Arg Asn Gly Asn His
145   150   155   160

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```
Arg Thr Pro Glu Glu Phe Leu Asp Ser Ser Glu Arg Pro Asp Ile Leu
             165             170             175

Leu Thr Val Ala Leu Ala Ser Leu Glu Leu Gly Arg Glu Gln Trp Gln
             180             185             190

Gln Gly His Tyr Glu Asn Ala Ala Leu Ser Leu Glu Thr Gly Gln Glu
             195             200             205

Val Leu Phe Ser Glu Gly Ile Phe Pro Ser Val Gln Ala Glu Ile Gln
    210             215             220

Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala
225             230             235             240

Leu Pro Gln Glu Lys Thr Ile Glu Arg His Gln Gly Leu Asp Leu Leu
             245             250             255

Gln Ser Ile Leu Asp Asp Arg Gly Gly Ile Asp Gly Thr Gly Asn Asp
             260             265             270

Gln Ser Gly Leu Asn Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln Leu
             275             280             285

Arg His His Leu Thr Val Ala Glu Gln His Lys Leu Phe Asp Gly Glu
    290             295             300

Ser Lys Arg Pro Ser Ala Val Ala Thr Tyr Leu Ala Val Tyr Ala Ser
305             310             315             320

Ile Ala Arg Gly Phe Thr Gln Arg Gln Pro Ala Leu Ile Arg His Ala
             325             330             335

Lys Gln Ile Leu Met Arg Leu Ser Lys Arg Gln Asp Val His Leu Glu
             340             345             350

Gln Ser Leu Cys Ala Leu Leu Leu Gly Gln Thr Glu Glu Ala Thr Arg
             355             360             365

Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala Leu Ala Leu Ile Arg Glu
    370             375             380

Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr Ala
385             390             395             400
```

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Glu Gln Trp Leu Gln Asn Glu Val Phe Pro His Phe Arg Asp Leu Ser
            405   410   415

Arg Gln Gln Ala Ser Leu Lys Asp Tyr Phe Ala Asn Gln Gln Val Gln
            420   425   430

Ala Tyr Leu Glu Ala Leu Pro Asn Asp Ala Glu Thr Thr Asn Glu Trp
            435   440   445

Ala Val Ile Asn Arg Gln Ser Phe Ser Gln Pro Arg Gly Asn Ser Tyr
            450   455   460

Ser Gly Gly Thr Pro Val Ala Lys Arg Pro Val Gly Lys Ala Asn Arg
465   470   475   480

Pro Gly Glu Ala Ser Thr Arg Pro Val Pro Gln Arg Ser His Pro Ser
            485   490   495

Glu Val Asn Arg Gln Phe His Gln Asn Arg Thr Pro Asp Pro Glu Leu
            500   505   510

Pro Glu Thr Ser Asn His Arg Arg Pro Glu Ser Ser Asn Phe Thr Thr
            515   520   525

Ala Arg Glu Asn Ile Ser Thr Thr Asp Ala Tyr Thr Asp Asn Tyr Pro
            530   535   540

Pro Glu Ile Pro Val Glu Arg Ala Ser Arg Pro Val Gln Pro Gly Val
545   550   555   560

Ser Gly Tyr Thr Gln Ser Thr Pro Pro Arg Gln Thr Pro Lys Arg Arg
            565   570   575

Arg Arg Lys Lys Pro Gln Ala Val Val Asn Arg Gly His Ser Ile His
            580   585   590

Gln Gln Arg Gln Pro Ser Pro Ser Thr Leu Gly Arg Lys Thr Arg Leu
            595   600   605

Leu Trp Ile Val Leu Gly Ser Leu Gly Gly Ile Leu Leu Phe Trp Leu
            610   615   620

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```
Ile Val Ser Thr Thr Phe Gly Trp Leu Lys Asn Val Phe Phe Pro Ala
625             630         635             640

Pro Ser Leu Gln Gly Glu Gln Leu Ser Ile Gln Ile Ser Gln Pro Pro
            645         650             655

Leu Glu Ile Pro Asp Lys Asn Ala Gln Ile Gln Ser Pro Glu Val Ser
        660         665             670

Leu Thr Glu Glu Thr Ala Arg Lys Ile Ile Glu Asn Trp Leu Ala Thr
        675         680             685

Lys Ala Ser Ala Leu Gly Ala Glu His Lys Ile Glu Ser Leu Asn Glu
    690         695             700

Ile Leu Thr Gly Ser Ala Leu Ser Gln Trp Arg Leu Ile Ala Leu Gln
705         710             715             720

Asp Lys Ala Asp Asn Arg His Arg Glu Tyr Ser His Ser Val Lys Val
            725             730             735

Asp Ser Ile Ser Lys Ser Asp Ile Asp Pro Asn Arg Ala Ser Val Gly
        740             745             750

Ala Thr Val Arg Glu Leu Thr Gln Phe Tyr Glu Asn Gly Gln Lys Gly
    755             760             765

Lys Ser Ser Asp Glu Arg Leu Arg Val Arg Tyr Glu Leu Ile Arg Gln
    770             775             780

Asp Asp Ile Trp Arg Ile Gln Arg Met Ser Ala Ala Ile Asn
785             790             795
```

<210> 166
<211> 2307
<212> DNA
<213> Nostoc punctiforme

<400> 166
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gtgcgaattc cgctagatta ctaccgaatt ttaggactac cgttagcggc aagtgaagaa      60

caattgcgac aggcatacag cgatcgcatt gtacaattgc cacgacgtga gtattctcag     120

gcagcaattt cttctcgtaa acaactcata gaagaagctt acgtggtttt atcagatcca     180

aaacaacgca gtacctacga tcagctttat cttgcccacg cctatgaccc tgataaacctt     240
```

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```
gctgctgccg cagtagcaca ggaaaatcgt acagaaagca ccaaaagggg tagtgatacc      300

cagagtcttg gtatagaaat tacccaagac gaattagttg gcgctttatt aattttgcaa      360

gagttgggtg aatacgaact tgtattgaaa ctaggtcgtc cgtacctagt aaataaaaat      420

agtgctacaa gttcaagaaa aagcaataac ttagcagatg aagaaattta tgaaagtgct      480

gaacacccag atgtcgttct cactgttgct cttgcctgtc tagaattagg tcgggaacag      540

tggcagcaag gtcactacga aaatgccgcc atatccctag aaactggtca agagctgcta      600

gtacgtgaag gtttgttctc cagtatccag gcagaaattc aggctgatct ttacaaattg      660

cggccatatc gaattttgga gttgctcgca ttacctcaag aaaagactgc cgaacgaagc      720

caaggcttag aattattgca aaatctctta gaagatcgtg gcgggattga tggcacgaac      780

aatgatgaat cgggtttaaa catagatgac tttctgcgat ttatccagca gttacgcaac      840

cacttaacag ttgcagaaca gcacaagtta tttgaagctc aaagcaaacg ttcttctgct      900

gttgccactt acttagctgt ttatgccttg atagcgcgag gatttgctca acggcaacct      960

gctttaattc gtcaagcaag acaaatgctc gtgcgtctgg gcaagcgcca agatgtacat     1020

ttagaacagt cgctatgtgc cttacttttg gggcaaactg aagaagcaac tcgtgtttta     1080

gaacttagtc aggagtacga agctttagct tttattcggg aaaaatctca ggactctcca     1140

gatttgttac cgggtctgtg tttatatgca gaacagtggc tgcaacacga agtctttccc     1200

cattttcgag atttagcaaa ccagcaagct ttcctaaaag attactttgc taaccaacag     1260

gtgcaagctt atttagaagc actgccaact gatgcccaaa caactaatga atgggctgta     1320

attacccccc agtattttcc ccaggccaag gcaaagaata ctcattttca taacaattca     1380

actaaaactt cagcgtcatt taatcacagc agagtaccta acccagattt gccagaaaca     1440

ccaacaaaag aaacctctga atatccaaac ttctcaccac ctatgtggag ttcatctgga     1500

agtataaaat cagaggttcc tgctgctgaa aggatgagca gaggtactaa tcagcatttg     1560

aacggttcag ctaagagtgc tgcatctggt cataaccaaa agcgtaggcg gagaaaacct     1620

actccatctg ctagccgaga gcgtatacca gataatcgtc ctcattctcg tcgtccccga     1680

aggcggcgaa cttttgcgaa caccatagaa ggtaaaacac ggctggtatg gagagtgttt     1740

atttctttgg tgagcatatt agttttttgg gtattagcca caacaacttt tggatggtta     1800

aaaaatctgt tttttcctca accttctccg cctgatctac agttgtttgt acaaataaac     1860

caaccaccgt tacctattcc cgatccaaat agaaaaccag aatcagaaga aggcccttta     1920

acaaatgcag aggcagaaga agttattcac acttggttat ctaccaaagc cgcagcttta     1980
```

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```
gggcccaatc atgagattaa taatttagag caaattttaa ctggttcagc tttatctcaa    2040

tggcgactga ttgctcaaca gaataagtta gacaatcgct accgcaagtt cgaccatagt    2100

ttgaagatag aatctgttga gaaaattggt ttatttgcag atcgtgccgc agtagaagct    2160

acggtcaaag aagtgacgca gttatatgaa aataatcagt ttaaaaactc ttctaacgat    2220

aaattaagag ttcggtatga cttgattcga gaacgaggta aatggcgtat tcagagtaca    2280

tctgttgtaa atcaattcac cagataa                                       2307
```

<210> 167
<211> 768
<212> PRT
<213> Nostoc punctiforme

<400> 167

```
Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala
1               5                   10                  15


Ala Ser Glu Glu Gln Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln
            20                  25                  30


Leu Pro Arg Arg Glu Tyr Ser Gln Ala Ala Ile Ser Ser Arg Lys Gln
        35                  40                  45


Leu Ile Glu Glu Ala Tyr Val Val Leu Ser Asp Pro Lys Gln Arg Ser
    50                  55                  60


Thr Tyr Asp Gln Leu Tyr Leu Ala His Ala Tyr Asp Pro Asp Asn Leu
65                  70                  75                  80


Ala Ala Ala Ala Val Ala Gln Glu Asn Arg Thr Glu Ser Thr Lys Arg
                85                  90                  95


Gly Ser Asp Thr Gln Ser Leu Gly Ile Glu Ile Thr Gln Asp Glu Leu
                100                 105                 110


Val Gly Ala Leu Leu Ile Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val
            115                 120                 125


Leu Lys Leu Gly Arg Pro Tyr Leu Val Asn Lys Asn Ser Ala Thr Ser
    130                 135                 140


Ser Arg Lys Ser Asn Asn Leu Ala Asp Glu Glu Ile Tyr Glu Ser Ala
145                 150                 155                 160
```

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```
Glu His Pro Asp Val Val Leu Thr Val Ala Leu Ala Cys Leu Glu Leu
                165             170             175

Gly Arg Glu Gln Trp Gln Gln Gly His Tyr Glu Asn Ala Ala Ile Ser
                180             185             190

Leu Glu Thr Gly Gln Glu Leu Leu Val Arg Glu Gly Leu Phe Ser Ser
            195             200             205

Ile Gln Ala Glu Ile Gln Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg
        210             215             220

Ile Leu Glu Leu Leu Ala Leu Pro Gln Glu Lys Thr Ala Glu Arg Ser
225             230             235             240

Gln Gly Leu Glu Leu Leu Gln Asn Leu Leu Glu Asp Arg Gly Gly Ile
            245             250             255

Asp Gly Thr Asn Asn Asp Glu Ser Gly Leu Asn Ile Asp Asp Phe Leu
            260             265             270

Arg Phe Ile Gln Gln Leu Arg Asn His Leu Thr Val Ala Glu Gln His
        275             280             285

Lys Leu Phe Glu Ala Gln Ser Lys Arg Ser Ser Ala Val Ala Thr Tyr
    290             295             300

Leu Ala Val Tyr Ala Leu Ile Ala Arg Gly Phe Ala Gln Arg Gln Pro
305             310             315             320

Ala Leu Ile Arg Gln Ala Arg Gln Met Leu Val Arg Leu Gly Lys Arg
            325             330             335

Gln Asp Val His Leu Glu Gln Ser Leu Cys Ala Leu Leu Leu Gly Gln
            340             345             350

Thr Glu Glu Ala Thr Arg Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala
            355             360             365
```

```
Leu Ala Phe Ile Arg Glu Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro
    370              375              380

Gly Leu Cys Leu Tyr Ala Glu Gln Trp Leu Gln His Glu Val Phe Pro
385              390              395              400

His Phe Arg Asp Leu Ala Asn Gln Gln Ala Phe Leu Lys Asp Tyr Phe
            405              410              415

Ala Asn Gln Gln Val Gln Ala Tyr Leu Glu Ala Leu Pro Thr Asp Ala
        420              425              430

Gln Thr Thr Asn Glu Trp Ala Val Ile Asn Pro Gln Tyr Phe Pro Gln
        435              440              445

Ala Lys Ala Lys Asn Thr His Phe His Asn Asn Ser Thr Lys Thr Ser
    450              455              460

Ala Ser Phe Asn His Ser Arg Val Pro Asn Pro Asp Leu Pro Glu Thr
465              470              475              480

Pro Thr Lys Glu Thr Ser Glu Tyr Pro Asn Phe Ser Pro Pro Met Trp
            485              490              495

Ser Ser Ser Gly Ser Ile Lys Ser Glu Val Pro Ala Ala Glu Arg Met
            500              505              510

Ser Arg Gly Thr Asn Gln His Leu Asn Gly Ser Ala Lys Ser Ala Ala
        515              520              525

Ser Gly His Asn Gln Lys Arg Arg Arg Lys Pro Thr Pro Ser Ala
        530              535              540

Ser Arg Glu Arg Ile Pro Asp Asn Arg Pro His Ser Arg Arg Pro Arg
545              550              555              560

Arg Arg Arg Thr Phe Ala Asn Thr Ile Glu Gly Lys Thr Arg Leu Val
            565              570              575

Trp Arg Val Phe Ile Ser Leu Val Ser Ile Leu Val Phe Trp Val Leu
            580              585              590
```

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```
Ala Thr Thr Thr Phe Gly Trp Leu Lys Asn Leu Phe Phe Pro Gln Pro
        595             600             605

Ser Pro Pro Asp Leu Gln Leu Phe Val Gln Ile Asn Gln Pro Pro Leu
        610             615             620

Pro Ile Pro Asp Pro Asn Arg Lys Pro Glu Ser Glu Glu Gly Pro Leu
625             630             635             640

Thr Asn Ala Glu Ala Glu Glu Val Ile His Thr Trp Leu Ser Thr Lys
        645             650             655

Ala Ala Ala Leu Gly Pro Asn His Glu Ile Asn Asn Leu Glu Gln Ile
        660             665             670

Leu Thr Gly Ser Ala Leu Ser Gln Trp Arg Leu Ile Ala Gln Gln Asn
        675             680             685

Lys Leu Asp Asn Arg Tyr Arg Lys Phe Asp His Ser Leu Lys Ile Glu
        690             695             700

Ser Val Glu Lys Ile Gly Leu Phe Ala Asp Arg Ala Ala Val Glu Ala
705             710             715             720

Thr Val Lys Glu Val Thr Gln Leu Tyr Glu Asn Asn Gln Phe Lys Asn
        725             730             735

Ser Ser Asn Asp Lys Leu Arg Val Arg Tyr Asp Leu Ile Arg Glu Arg
        740             745             750

Gly Lys Trp Arg Ile Gln Ser Thr Ser Val Val Asn Gln Phe Thr Arg
        755             760             765


<210>  168
<211>  2145
<212>  DNA
<213>  Synechocystis PCC6803

<400>  168
gtgtttatcc ccctcgactt ttatcgtatt ttaggcattc ctcccagag tggtgggaa      60

accattgagc aggcctacca agatcgcctt ttacaattac cccggcgaga atttagtgac     120

gccgcagtta ctctccgcaa tcaattactg gcgatcgcct atgaaaccct gagggatccg     180

gaaaaacgtc aggcatacga ccaagaatgg tggggagcca tggatgaagc cctgggggag     240
```

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```
gccttacccc tcactacccc ggagttggaa tgtagcccag agcaagaaat tggagccctg      300

ttgatcctgt tggatttggg ggaatacgaa ctcgtggtta agtatggtga gccagtactc      360

cacgatccca accctccggc gggaggcctg ccccaggact atttgctttc ggtaattttg      420

gcccactggg aactgagccg ggaacgttgg caacaacagc agtatgaatt tgccgccacc      480

gccagtctta aggccctagc tcggttgcaa caggataatg acttccccgc cttggaagca      540

gaaattcgtc aggaactata ccgtctgcga ccctaccgta tcctcgaact tttggctaag      600

gaggggcaag gggaggagca acgtcagcag ggtctagctc tgttgcaagc gatggtgcag      660

gaccggggcg gcattgaagg taagggggaa gattattccg gattgggaaa tgatgacttt      720

ctaaaattca tccaccaact acgctgtcac ctcacagtgg ccgagcaaaa cgccctattt      780

ttgcccgaaa gtcaacggcc atctttagta gcaagctatt tggcagtaca tagtctgatg      840

gctgagggag tgaaggaaca ggaccccatg gccattgtcg aagcaaaatc tttgattata      900

cagttggaaa attgtcaaga tttggcccta gaaaaggtaa tttgtgaatt attattgggt      960

caaacggaag ttgttctggc ggcgatcgac cagggagatc cgaaaatagt agctggcctc     1020

gaatctaagt tagcgacggg ggaagacccc ttaactgctt tttatacttt cactgagcag     1080

tggctagagg aagaaattgt cccctacttt agggatcttt ctccggagac cctttccccc     1140

aaggcctatt tcaataatcc ctccgttcag cagtatctag aacaactaga gccggattcc     1200

ttcaccactg acaattcttt tgcctcccct gccctcctta gcaccgcaac ggaatcggaa     1260

actcccatgg tacatagttc cgccgccctt cccgatcgcc ctttgacctc caccgttccc     1320

tcacgacggg gacgcagtcc aagacgttcc cgagacgatg ttttccccag cgccgacaat     1380

tccagtggtt tggccgtcac caccctatct ccggcgatcg cctacgacac ccactccttg     1440

ggcaccaacg gtattggcgg ggatagcact agcaacggtt tttccagtaa ctccgcccca     1500

gaatccacca gtaaacataa atctccccgg cgacgcaaaa aacgggtgac catcaagccg     1560

gtgcgcttcg gcattttttct gctttgccta gcaggcattg tgggggggggc aactgcccta     1620

attatcaatc gtactggcga tcccctaggt gggttgctag aagacccct agatgttttc     1680

ctggaccaac cttcagaatt tatccccgat gaagccacga gccggaattt gattctcagt     1740

caacccaact tcaatcagca agtgggtcag atggtagtac aaggctggct tgatagtaaa     1800

aagttagcct ttggccaaaa ctacgatgtc ggggcattgc agagtgtttt agcccccaat     1860

ctccttgccc aacaacgggg tcgggcccaa cgggatcaag cccaaaaggt ctatcaccaa     1920

tacgaacaca agttgcagat tttagcctat caagttaacc cccaagaccc caaccgagcc     1980
```

-180-

accgttactg cccgggtaga agaaattagc cagcccttta ccctaggtaa tcaacagcag   2040

aagggctccg ccaccaaaga tgacttgact gtgcgctatc agctagtacg acaccaaggg   2100

gtttggaaaa ttgaccaaat acaagtggta aatggccccc gttag   2145

<210> 169
<211> 714
<212> PRT
<213> Synechocystis PCC6803

<400> 169

Met Phe Ile Pro Leu Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln
1   5   10   15

Ser Gly Gly Glu Thr Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln
                20   25   30

Leu Pro Arg Arg Glu Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln
            35   40   45

Leu Leu Ala Ile Ala Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln
        50   55   60

Ala Tyr Asp Gln Glu Trp Trp Gly Ala Met Asp Glu Ala Leu Gly Glu
65   70   75   80

Ala Leu Pro Leu Thr Thr Pro Glu Leu Glu Cys Ser Pro Glu Gln Glu
                85   90   95

Ile Gly Ala Leu Leu Ile Leu Leu Asp Leu Gly Glu Tyr Glu Leu Val
                100   105   110

Val Lys Tyr Gly Glu Pro Val Leu His Asp Pro Asn Pro Pro Ala Gly
            115   120   125

Gly Leu Pro Gln Asp Tyr Leu Leu Ser Val Ile Leu Ala His Trp Glu
        130   135   140

Leu Ser Arg Glu Arg Trp Gln Gln Gln Gln Tyr Glu Phe Ala Ala Thr
145   150   155   160

Ala Ser Leu Lys Ala Leu Ala Arg Leu Gln Gln Asp Asn Asp Phe Pro
                165   170   175

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Ala Leu Glu Ala Glu Ile Arg Gln Glu Leu Tyr Arg Leu Arg Pro Tyr
            180   185   190

Arg Ile Leu Glu Leu Leu Ala Lys Glu Gly Gln Gly Glu Glu Gln Arg
            195   200   205

Gln Gln Gly Leu Ala Leu Leu Gln Ala Met Val Gln Asp Arg Gly Gly
            210   215   220

Ile Glu Gly Lys Gly Glu Asp Tyr Ser Gly Leu Gly Asn Asp Asp Phe
225   230   235   240

Leu Lys Phe Ile His Gln Leu Arg Cys His Leu Thr Val Ala Glu Gln
                245   250   255

Asn Ala Leu Phe Leu Pro Glu Ser Gln Arg Pro Ser Leu Val Ala Ser
                260   265   270

Tyr Leu Ala Val His Ser Leu Met Ala Glu Gly Val Lys Glu Gln Asp
            275   280   285

Pro Met Ala Ile Val Glu Ala Lys Ser Leu Ile Ile Gln Leu Glu Asn
    290   295   300

Cys Gln Asp Leu Ala Leu Glu Lys Val Ile Cys Glu Leu Leu Leu Gly
305   310   315   320

Gln Thr Glu Val Val Leu Ala Ala Ile Asp Gln Gly Asp Pro Lys Ile
                325   330   335

Val Ala Gly Leu Glu Ser Lys Leu Ala Thr Gly Glu Asp Pro Leu Thr
            340   345   350

Ala Phe Tyr Thr Phe Thr Glu Gln Trp Leu Glu Glu Glu Ile Val Pro
            355   360   365

Tyr Phe Arg Asp Leu Ser Pro Glu Thr Leu Ser Pro Lys Ala Tyr Phe
    370   375   380

Asn Asn Pro Ser Val Gln Gln Tyr Leu Glu Gln Leu Glu Pro Asp Ser
385   390   395   400

Phe Thr Thr Asp Asn Ser Phe Ala Ser Pro Ala Leu Leu Ser Thr Ala
                405   410   415

-182-

```
Thr Glu Ser Glu Thr Pro Met Val His Ser Ser Ala Ala Leu Pro Asp
        420             425             430

Arg Pro Leu Thr Ser Thr Val Pro Ser Arg Arg Gly Arg Ser Pro Arg
        435             440             445

Arg Ser Arg Asp Asp Val Phe Pro Ser Ala Asp Asn Ser Ser Gly Leu
    450             455             460

Ala Val Thr Thr Leu Ser Pro Ala Ile Ala Tyr Asp Thr His Ser Leu
465             470             475                         480

Gly Thr Asn Gly Ile Gly Gly Asp Ser Thr Ser Asn Gly Phe Ser Ser
            485             490             495

Asn Ser Ala Pro Glu Ser Thr Ser Lys His Lys Ser Pro Arg Arg Arg
            500             505             510

Lys Lys Arg Val Thr Ile Lys Pro Val Arg Phe Gly Ile Phe Leu Leu
        515             520             525

Cys Leu Ala Gly Ile Val Gly Gly Ala Thr Ala Leu Ile Ile Asn Arg
    530             535             540

Thr Gly Asp Pro Leu Gly Gly Leu Leu Glu Asp Pro Leu Asp Val Phe
545             550             555                         560

Leu Asp Gln Pro Ser Glu Phe Ile Pro Asp Glu Ala Thr Ser Arg Asn
            565             570             575

Leu Ile Leu Ser Gln Pro Asn Phe Asn Gln Gln Val Gly Gln Met Val
            580             585             590

Val Gln Gly Trp Leu Asp Ser Lys Lys Leu Ala Phe Gly Gln Asn Tyr
        595             600             605

Asp Val Gly Ala Leu Gln Ser Val Leu Ala Pro Asn Leu Leu Ala Gln
    610             615             620

Gln Arg Gly Arg Ala Gln Arg Asp Gln Ala Gln Lys Val Tyr His Gln
625             630             635             640
```

Tyr Glu His Lys Leu Gln Ile Leu Ala Tyr Gln Val Asn Pro Gln Asp
          645   650   655

Pro Asn Arg Ala Thr Val Thr Ala Arg Val Glu Glu Ile Ser Gln Pro
          660   665   670

Phe Thr Leu Gly Asn Gln Gln Gln Lys Gly Ser Ala Thr Lys Asp Asp
          675   680   685

Leu Thr Val Arg Tyr Gln Leu Val Arg His Gln Gly Val Trp Lys Ile
          690   695   700

Asp Gln Ile Gln Val Val Asn Gly Pro Arg
705   710

<210>   170
<211>   714
<212>   PRT
<213>   Synechocystis PCC6803

<400>   170

Met Phe Ile Pro Leu Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln
1   5   10   15

Ser Gly Gly Glu Thr Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln
          20   25   30

Leu Pro Arg Arg Glu Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln
          35   40   45

Leu Leu Ala Ile Ala Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln
          50   55   60

Ala Tyr Asp Gln Glu Trp Trp Gly Ala Met Asp Glu Ala Leu Gly Glu
65   70   75   80

Ala Leu Pro Leu Thr Thr Pro Glu Leu Glu Cys Ser Pro Glu Gln Glu
              85   90   95

Ile Gly Ala Leu Leu Ile Leu Leu Asp Leu Gly Glu Tyr Glu Leu Val
          100   105   110

Val Lys Tyr Gly Glu Pro Val Leu His Asp Pro Asn Pro Pro Ala Gly
          115   120   125

```
Gly Leu Pro Gln Asp Tyr Leu Leu Ser Val Ile Leu Ala His Trp Glu
    130             135             140

Leu Ser Arg Glu Arg Trp Gln Gln Gln Tyr Glu Phe Ala Ala Thr
145             150             155             160

Ala Ser Leu Lys Ala Leu Ala Arg Leu Gln Gln Asp Asn Asp Phe Pro
            165             170             175

Ala Leu Glu Ala Glu Ile Arg Gln Glu Leu Tyr Arg Leu Arg Pro Tyr
            180             185             190

Arg Ile Leu Glu Leu Leu Ala Lys Glu Gly Gln Gly Glu Glu Gln Arg
        195             200             205

Gln Gln Gly Leu Ala Leu Leu Gln Ala Met Val Gln Asp Arg Gly Gly
    210             215             220

Ile Glu Gly Lys Gly Glu Asp Tyr Ser Gly Leu Gly Asn Asp Asp Phe
225             230             235             240

Leu Lys Phe Ile His Gln Leu Arg Cys His Leu Thr Val Ala Glu Gln
            245             250             255

Asn Ala Leu Phe Leu Pro Glu Ser Gln Arg Pro Ser Leu Val Ala Ser
            260             265             270

Tyr Leu Ala Val His Ser Leu Met Ala Glu Gly Val Lys Glu Gln Asp
        275             280             285

Pro Met Ala Ile Val Glu Ala Lys Ser Leu Ile Ile Gln Leu Glu Asn
    290             295             300

Cys Gln Asp Leu Ala Leu Glu Lys Val Ile Cys Glu Leu Leu Leu Gly
305             310             315             320

Gln Thr Glu Val Val Leu Ala Ala Ile Asp Gln Gly Asp Pro Lys Ile
            325             330             335

Val Ala Gly Leu Glu Ser Lys Leu Ala Thr Gly Glu Asp Pro Leu Thr
        340             345             350

Ala Phe Tyr Thr Phe Thr Glu Gln Trp Leu Glu Glu Glu Ile Val Pro
        355             360             365
```

```
Tyr Phe Arg Asp Leu Ser Pro Glu Thr Leu Ser Pro Lys Ala Tyr Phe
    370             375             380

Asn Asn Pro Ser Val Gln Gln Tyr Leu Glu Gln Leu Glu Pro Asp Ser
385             390             395             400

Phe Thr Thr Asp Asn Ser Phe Ala Ser Pro Ala Leu Leu Ser Thr Ala
            405             410             415

Thr Glu Ser Glu Thr Pro Met Val His Ser Ser Ala Ala Leu Pro Asp
            420             425             430

Arg Pro Leu Thr Ser Thr Val Pro Ser Arg Arg Gly Arg Ser Pro Arg
        435             440             445

Arg Ser Arg Asp Asp Val Phe Pro Ser Ala Asp Asn Ser Ser Gly Leu
    450             455             460

Ala Val Thr Thr Leu Ser Pro Ala Ile Ala Tyr Asp Thr His Ser Leu
465             470             475             480

Gly Thr Asn Gly Ile Gly Gly Asp Ser Thr Ser Asn Gly Phe Ser Ser
            485             490             495

Asn Ser Ala Pro Glu Ser Thr Ser Lys His Lys Ser Pro Arg Arg Arg
            500             505             510

Lys Lys Arg Val Thr Ile Lys Pro Val Arg Phe Gly Ile Phe Leu Leu
        515             520             525

Cys Leu Ala Gly Ile Val Gly Gly Ala Thr Ala Leu Ile Ile Asn Arg
        530             535             540

Thr Gly Asp Pro Leu Gly Gly Leu Leu Glu Asp Pro Leu Asp Val Phe
545             550             555             560

Leu Asp Gln Pro Ser Glu Phe Ile Pro Asp Glu Ala Thr Ser Arg Asn
            565             570             575
```

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Leu Ile Leu Ser Gln Pro Asn Phe Asn Gln Gln Val Gly Gln Met Val
        580   585   590

Val Gln Gly Trp Leu Asp Ser Lys Lys Leu Ala Phe Gly Gln Asn Tyr
        595   600   605

Asp Val Gly Ala Leu Gln Ser Val Leu Ala Pro Asn Leu Leu Ala Gln
    610   615   620

Gln Arg Gly Arg Ala Gln Arg Asp Gln Ala Gln Lys Val Tyr His Gln
625   630   635   640

Tyr Glu His Lys Leu Gln Ile Leu Ala Tyr Gln Val Asn Pro Gln Asp
            645   650   655

Pro Asn Arg Ala Thr Val Thr Ala Arg Val Glu Glu Ile Ser Gln Pro
            660   665   670

Phe Thr Leu Gly Asn Gln Gln Gln Lys Gly Ser Ala Thr Lys Asp Asp
        675   680   685

Leu Thr Val Arg Tyr Gln Leu Val Arg His Gln Gly Val Trp Lys Ile
    690   695   700

Asp Gln Ile Gln Val Val Asn Gly Pro Arg
705   710

<210>   171
<211>   819
<212>   PRT
<213>   Arabidopsis thaliana

<400>   171

Met Pro Val Ala Tyr Thr Phe Pro Val Leu Pro Ser Ser Cys Leu Leu
1   5   10   15

Cys Gly Ile Ser Asn Arg Ser Thr Ser Phe Val Val Asp Arg Pro Glu
            20   25   30

Leu Gln Ile Ser Gly Leu Leu Val Val Arg Ser Glu Ser Gly Glu Phe
        35   40   45

Phe Gly Ser Gly Leu Ser Leu Arg Arg Phe Gln Arg Glu Gly Arg Arg
    50   55   60

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Arg Leu Asn Ala Ala Gly Gly Gly Ile His Val Val Asp Asn Ala Pro
65              70              75                  80

Ser Arg Thr Ser Ser Leu Ala Ala Ser Thr Ser Thr Ile Glu Leu Pro
                85              90                  95

Val Thr Cys Tyr Gln Leu Ile Gly Val Ser Glu Gln Ala Glu Lys Asp
            100             105             110

Glu Val Val Lys Ser Val Ile Asn Leu Lys Lys Thr Asp Ala Glu Glu
        115             120             125

Gly Tyr Thr Met Glu Ala Ala Ala Ala Arg Gln Asp Leu Leu Met Asp
    130             135             140

Val Arg Asp Lys Leu Leu Phe Glu Ser Glu Tyr Ala Gly Asn Leu Lys
145             150             155                 160

Glu Lys Ile Ala Pro Lys Ser Pro Leu Arg Ile Pro Trp Ala Trp Leu
            165             170             175

Pro Gly Ala Leu Cys Leu Leu Gln Glu Val Gly Gln Glu Lys Leu Val
            180             185             190

Leu Asp Ile Gly Arg Ala Ala Leu Arg Asn Leu Asp Ser Lys Pro Tyr
            195             200             205

Ile His Asp Ile Phe Leu Ser Met Ala Leu Ala Glu Cys Ala Ile Ala
    210             215             220

Lys Ala Ala Phe Glu Val Asn Lys Val Ser Gln Gly Phe Glu Ala Leu
225             230             235             240

Ala Arg Ala Gln Ser Phe Leu Lys Ser Lys Val Thr Leu Gly Lys Leu
            245             250             255

Ala Leu Leu Thr Gln Ile Glu Glu Ser Leu Glu Gly Leu Ala Pro Pro
            260             265             270

Cys Thr Leu Asp Leu Leu Gly Leu Pro Arg Thr Pro Glu Asn Ala Glu
    275             280             285
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Arg Arg Arg Gly Ala Ile Ala Ala Leu Arg Glu Leu Leu Arg Gln Gly
    290             295             300

Leu Ser Val Glu Ala Ser Cys Gln Ile Gln Asp Trp Pro Cys Phe Leu
305             310             315             320

Ser Gln Ala Ile Ser Arg Leu Leu Ala Thr Glu Ile Val Asp Leu Leu
            325             330             335

Pro Trp Asp Asp Leu Ala Ile Thr Arg Lys Asn Lys Lys Ser Leu Glu
        340             345             350

Ser His Asn Gln Arg Val Val Ile Asp Phe Asn Cys Phe Tyr Met Val
        355             360             365

Leu Leu Gly His Ile Ala Val Gly Phe Ser Gly Lys Gln Asn Glu Thr
    370             375             380

Ile Asn Lys Ala Lys Thr Ile Cys Glu Cys Leu Ile Ala Ser Glu Gly
385             390             395             400

Val Asp Leu Lys Phe Glu Glu Ala Phe Cys Ser Phe Leu Leu Lys Gln
            405             410             415

Gly Ser Glu Ala Glu Ala Leu Glu Lys Leu Lys Gln Leu Glu Ser Asn
        420             425             430

Ser Asp Ser Ala Val Arg Asn Ser Ile Leu Gly Lys Glu Ser Arg Ser
        435             440             445

Thr Ser Ala Thr Pro Ser Leu Glu Ala Trp Leu Met Glu Ser Val Leu
    450             455             460

Ala Asn Phe Pro Asp Thr Arg Gly Cys Ser Pro Ser Leu Ala Asn Phe
465             470             475             480

Phe Arg Ala Glu Lys Lys Tyr Pro Glu Asn Lys Lys Met Gly Ser Pro
            485             490             495

Ser Ile Met Asn His Lys Thr Asn Gln Arg Pro Leu Ser Thr Thr Gln
            500             505             510

Phe Val Asn Ser Ser Gln His Leu Tyr Thr Ala Val Glu Gln Leu Thr
            515             520             525
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Pro Thr Asp Leu Gln Ser Pro Val Val Ser Ala Lys Asn Asn Asp Glu
    530   535   540

Thr Ser Ala Ser Met Pro Ser Val Gln Leu Lys Arg Asn Leu Gly Val
545   550   555   560

His Lys Asn Lys Ile Trp Asp Glu Trp Leu Ser Gln Ser Ser Leu Ile
                565   570   575

Gly Arg Val Ser Val Val Ala Leu Leu Gly Cys Thr Val Phe Phe Ser
            580   585   590

Leu Lys Leu Ser Gly Ile Arg Ser Gly Arg Leu Gln Ser Met Pro Ile
        595   600   605

Ser Val Ser Ala Arg Pro His Ser Glu Ser Asp Ser Phe Leu Trp Lys
    610   615   620

Thr Glu Ser Gly Asn Phe Arg Lys Asn Leu Asp Ser Val Asn Arg Asn
625   630   635   640

Gly Ile Val Gly Asn Ile Lys Val Leu Ile Asp Met Leu Lys Met His
            645   650   655

Cys Gly Glu His Pro Asp Ala Leu Tyr Leu Lys Ser Ser Gly Gln Ser
            660   665   670

Ala Thr Ser Leu Ser His Ser Ala Ser Glu Leu His Lys Arg Pro Met
        675   680   685

Asp Thr Glu Glu Ala Glu Glu Leu Val Arg Gln Trp Glu Asn Val Lys
    690   695   700

Ala Glu Ala Leu Gly Pro Thr His Gln Val Tyr Ser Leu Ser Glu Val
705   710   715   720

Leu Asp Glu Ser Met Leu Val Gln Trp Gln Thr Leu Ala Gln Thr Ala
            725   730   735

Glu Ala Lys Ser Cys Tyr Trp Arg Phe Val Leu Leu His Leu Glu Val
            740   745   750

Leu Gln Ala His Ile Phe Glu Asp Gly Ile Ala Gly Glu Ala Ala Glu
        755   760   765

Ile Glu Ala Leu Leu Glu Glu Ala Ala Glu Leu Val Asp Glu Ser Gln
        770   775   780

Pro Lys Asn Ala Lys Tyr Tyr Ser Thr Tyr Lys Ile Arg Tyr Ile Leu
785   790   795   800

Lys Lys Gln Glu Asp Gly Leu Trp Lys Phe Cys Gln Ser Asp Ile Gln
            805   810   815

Ile Gln Lys

<210> 172
<211> 2857
<212> DNA
<213> Arabidopsis thaliana

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caacaaattg taccatgatt ccagcttcac tctacttctt ctagggttcg ttcgttttct   120

ggagctgttg cgcaatgcca gtagcttaca catttccagt tctcccttct tcttgtctgc   180

tttgcggaat ctccaatcgc agcaccagct tcgtcgtaga tcgcccggag cttcagatct   240

caggtctcct cgtcgttcgt tctgaatccg gtgaattctt cggttctggt ttatctttgc   300

ggcggtttca gcgagaagga cggaggaggt tgaatgctgc tggtggtggt atccatgtcg   360

tcgacaatgc gccgtctcgt acttcttctc tcgctgcatc tacctctaca atcgaactcc   420

cggttacgtg ttaccagctt atcggagttt ctgagcaagc tgagaaagac gaggtcgtta   480

agtcggttat aaatttgaaa aaaactgatg ctgaagaggg ttatacaatg gaagctgctg   540

cagctcgcca ggatcttctc atggatgtta gggataaact tcttttgaa tcagaatatg   600

ctggtaacct aaaagaaaag attgctccta atctcctct cagaattccg tgggcatggt   660

tgcctggtgc tctatgcctt cttcaagagg ttggacaaga aaaacttgtg ctggatattg   720

gccgggctgc tctcaggaac cttgattcaa agccatatat tcatgatata ttcttatcta   780

tggcacttgc tgagtgtgca attgccaagg ctgctttcga ggttaacaag gtctctcaag   840

gatttgaagc tcttgctcgt gctcaaagtt ttctgaagag taaagttact cttgggaaac   900

ttgcattgtt aactcagatt gaggagtcac tagaggggct tgcaccacct tgcacattgg   960

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atctactggg cctgccacgc acgccagaaa atgcagagag gaggcgaggt gcaattgccg    1020

cgctacgcga actgctcaga cagggcctta gtgttgaagc ttcatgtcaa attcaagact    1080

ggccatgctt tttgagccag gcaattagca ggttattggc cacagagatt gtcgatcttc    1140

ttccatggga tgatttagcc attacacgga aaaataaaaa atcactggaa tcccacaatc    1200

aaagagttgt tattgatttt aattgtttct acatggtgtt acttggtcac atcgctgttg    1260

gattttcagg caagcaaaat gaaacgatta ataaagcaaa aacgatatgc gaatgtctca    1320

tagcatcaga aggtgttgat ctgaaatttg aggaagcttt ttgctcattt cttctaaaac    1380

agggttccga ggcagaggcc ctggaaaaac ttaagcagct ggaatcaaat tcagactctg    1440

ccgttcgtaa ttcgatcttg gggaaagagt cgagaagtac ttctgctact ccctcactgg    1500

aagcgtggct aatggagtcc gtgcttgcta actttccaga cacaaggggt tgttctccat    1560

ctttggccaa ttttttccgg gctgaaaaga aatatccaga aaacaagaaa atggggtcac    1620

cttcgatcat gaatcataag acgaaccaaa gaccactttc cacaacacag ttcgtgaact    1680

cgtcacaaca tctttataca gctgtcgagc agttgacacc aacagatttg cagagcccag    1740

tggtatcagc caagaataat gatgaaacca gtgccagtat gccatctgtt caactgaaga    1800

ggaaccttgg tgtacacaaa aataaaatat gggatgagtg gctctctcaa agcagtttga    1860

tcggaagggt atctgttgtt gctttactgg gttgcaccgt gttcttctct ctgaagctat    1920

caggcattag gtctggtaga ctacagagta tgcctatatc ggtttctgct aggccgcatt    1980

cagaatcaga ttcttttctg tggaaaacag agtctgggaa tttcagaaaa aaccttgatt    2040

ctgtgaatag aaatggtatc gtgggaaaca tcaaagtgct cattgacatg ttaaagatgc    2100

attgtggcga acatccggat gccctgtatc tgaaaagctc tggtcaatca gctacatcat    2160

tgtctcattc tgcgtcagaa ctgcataaga gaccaatgga tacagaagaa gcggaagagc    2220

ttgtgagaca gtgggaaaat gttaaggctg aagctcttgg accaacacat caagtttata    2280

gcctttccga agtccttgat gaatccatgc ttgtccagtg gcaaacattg gcacaaacag    2340

cagaggcgaa atcctgttat tggaggttcg ttctgcttca tcttgaggtt ttgcaagcac    2400

atatattcga agatggtatt gctggtgagg ctgcagaaat cgaagctctt ctggaggaag    2460

cagcagaatt agttgatgaa tctcagccca aaaacgcaaa atattatagc acttacaaga    2520

tccgatatat tctgaagaag caagaagatg gattgtggaa attctgccaa agcgatattc    2580

aaatacagaa gtgaaaatcc cccagaaaaa aaagctcatc atctaactaa aggttgtagc    2640

atcaacagta gaacatggga tcatttagct aacggttgtt cttgtttacc taacggtgta    2700
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ggaaagtctc aggtttgttt ctttattcct tagtaaccca caggatttgt ctttgtagat    2760

tcttttgatt tcaatgtgtt tatggataaa caaacttctt gagtattttt tttattatta    2820

ttgtaaagcg ttactgatca caaaaaaaaa aaaaaaa                              2857
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<210> 173
<211> 819
<212> PRT
<213> Arabidopsis thaliana

<400> 173

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Cys Gly Ile Ser Asn Arg Ser Thr Ser Phe Val Val Asp Arg Pro Glu
                20                  25                  30


Leu Gln Ile Ser Gly Leu Leu Val Val Arg Ser Glu Ser Gly Glu Phe
            35                  40                  45


Phe Gly Ser Gly Leu Ser Leu Arg Arg Phe Gln Arg Glu Gly Arg Arg
        50                  55                  60


Arg Leu Asn Ala Ala Gly Gly Gly Ile His Val Val Asp Asn Ala Pro
65                  70                  75                  80


Ser Arg Thr Ser Ser Leu Ala Ala Ser Thr Ser Thr Ile Glu Leu Pro
                85                  90                  95


Val Thr Cys Tyr Gln Leu Ile Gly Val Ser Glu Gln Ala Glu Lys Asp
                100                 105                 110


Glu Val Val Lys Ser Val Ile Asn Leu Lys Lys Thr Asp Ala Glu Glu
            115                 120                 125


Gly Tyr Thr Met Glu Ala Ala Ala Ala Arg Gln Asp Leu Leu Met Asp
        130                 135                 140


Val Arg Asp Lys Leu Leu Phe Glu Ser Glu Tyr Ala Gly Asn Leu Lys
145                 150                 155                 160


Glu Lys Ile Ala Pro Lys Ser Pro Leu Arg Ile Pro Trp Ala Trp Leu
                165                 170                 175
```

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```
Pro Gly Ala Leu Cys Leu Leu Gln Glu Val Gly Gln Glu Lys Leu Val
            180                 185                 190

Leu Asp Ile Gly Arg Ala Ala Leu Arg Asn Leu Asp Ser Lys Pro Tyr
            195                 200                 205

Ile His Asp Ile Phe Leu Ser Met Ala Leu Ala Glu Cys Ala Ile Ala
            210                 215                 220

Lys Ala Ala Phe Glu Val Asn Lys Val Ser Gln Gly Phe Glu Ala Leu
225                 230                 235                 240

Ala Arg Ala Gln Ser Phe Leu Lys Ser Lys Val Thr Leu Gly Lys Leu
                245                 250                 255

Ala Leu Leu Thr Gln Ile Glu Glu Ser Leu Glu Gly Leu Ala Pro Pro
            260                 265                 270

Cys Thr Leu Asp Leu Leu Gly Leu Pro Arg Thr Pro Glu Asn Ala Glu
            275                 280                 285

Arg Arg Arg Gly Ala Ile Ala Ala Leu Arg Glu Leu Leu Arg Gln Gly
    290                 295                 300

Leu Ser Val Glu Ala Ser Cys Gln Ile Gln Asp Trp Pro Cys Phe Leu
305                 310                 315                 320

Ser Gln Ala Ile Ser Arg Leu Leu Ala Thr Glu Ile Val Asp Leu Leu
                325                 330                 335

Pro Trp Asp Asp Leu Ala Ile Thr Arg Lys Asn Lys Lys Ser Leu Glu
            340                 345                 350

Ser His Asn Gln Arg Val Val Ile Asp Phe Asn Cys Phe Tyr Met Val
            355                 360                 365

Leu Leu Gly His Ile Ala Val Gly Phe Ser Gly Lys Gln Asn Glu Thr
            370                 375                 380

Ile Asn Lys Ala Lys Thr Ile Cys Glu Cys Leu Ile Ala Ser Glu Gly
385                 390                 395                 400

Val Asp Leu Lys Phe Glu Glu Ala Phe Cys Ser Phe Leu Leu Lys Gln
                405                 410                 415
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Gly Ser Glu Ala Glu Ala Leu Glu Lys Leu Lys Gln Leu Glu Ser Asn
        420             425             430

Ser Asp Ser Ala Val Arg Asn Ser Ile Leu Gly Lys Glu Ser Arg Ser
        435             440             445

Thr Ser Ala Thr Pro Ser Leu Glu Ala Trp Leu Met Glu Ser Val Leu
    450             455             460

Ala Asn Phe Pro Asp Thr Arg Gly Cys Ser Pro Ser Leu Ala Asn Phe
465             470             475             480

Phe Arg Ala Glu Lys Lys Tyr Pro Glu Asn Lys Lys Met Gly Ser Pro
            485             490             495

Ser Ile Met Asn His Lys Thr Asn Gln Arg Pro Leu Ser Thr Thr Gln
        500             505             510

Phe Val Asn Ser Ser Gln His Leu Tyr Thr Ala Val Glu Gln Leu Thr
        515             520             525

Pro Thr Asp Leu Gln Ser Pro Val Val Ser Ala Lys Asn Asn Asp Glu
    530             535             540

Thr Ser Ala Ser Met Pro Ser Val Gln Leu Lys Arg Asn Leu Gly Val
545             550             555             560

His Lys Asn Lys Ile Trp Asp Glu Trp Leu Ser Gln Ser Ser Leu Ile
            565             570             575

Gly Arg Val Ser Val Val Ala Leu Leu Gly Cys Thr Val Phe Phe Ser
            580             585             590

Leu Lys Leu Ser Gly Ile Arg Ser Gly Arg Leu Gln Ser Met Pro Ile
        595             600             605

Ser Val Ser Ala Arg Pro His Ser Glu Ser Asp Ser Phe Leu Trp Lys
    610             615             620

Thr Glu Ser Gly Asn Phe Arg Lys Asn Leu Asp Ser Val Asn Arg Asn
625             630             635             640
```

```
Gly Ile Val Gly Asn Ile Lys Val Leu Ile Asp Met Leu Lys Met His
            645             650                 655

Cys Gly Glu His Pro Asp Ala Leu Tyr Leu Lys Ser Ser Gly Gln Ser
            660             665                 670

Ala Thr Ser Leu Ser His Ser Ala Ser Glu Leu His Lys Arg Pro Met
            675             680                 685

Asp Thr Glu Glu Ala Glu Glu Leu Val Arg Gln Trp Glu Asn Val Lys
    690             695                 700

Ala Glu Ala Leu Gly Pro Thr His Gln Val Tyr Ser Leu Ser Glu Val
705                 710             715                     720

Leu Asp Glu Ser Met Leu Val Gln Trp Gln Thr Leu Ala Gln Thr Ala
                725             730                 735

Glu Ala Lys Ser Cys Tyr Trp Arg Phe Val Leu Leu His Leu Glu Val
            740             745                 750

Leu Gln Ala His Ile Phe Glu Asp Gly Ile Ala Gly Glu Ala Ala Glu
            755             760                 765

Ile Glu Ala Leu Leu Glu Glu Ala Ala Glu Leu Val Asp Glu Ser Gln
    770             775                 780

Pro Lys Asn Ala Lys Tyr Tyr Ser Thr Tyr Lys Ile Arg Tyr Ile Leu
785                 790                 795                 800

Lys Lys Gln Glu Asp Gly Leu Trp Lys Phe Cys Gln Ser Asp Ile Gln
                805             810                 815

Ile Gln Lys


<210>   174
<211>   491
<212>   DNA
<213>   Triticum aestivum


<220>
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<222>   (22)..(22)
<223>   n is a, c, g, or t
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<220>
<221> misc_feature
<222> (451)..(451)
<223> n is a, c, g, or t

<220>
<221> misc_feature
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<223> n is a, c, g, or t

<220>
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<222> (483)..(484)
<223> n is a, c, g, or t

<220>
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<222> (487)..(487)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (489)..(490)
<223> n is a, c, g, or t

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gagtatgacc gcgcgctctc tgaggaccgt gacgcggcgc tcacactgga tgttgcttgg   120

gacaaggttc cgggtgtgct atgtgccctt caggaggctg gggaggcaca ggcagtgctt   180

gcaattggag agcacttact ggaggaccgc ccgcccaagc ggttcaagca ggatgtggtg   240

ctggcaatgg cgctcgctta tgtggacata tcaagggatg caatggcggc tagccctcca   300

gatgtaatcc gctgctgtga ggtgcttgaa agggctctca agctcttgca ggaggatggg   360

gcaatcaacc ttgcacctgg tctgctttca caaattgatg aaactctgga ggagatcaca   420

cctcgttgtg ttttggagct tcttgccctt nctcttgatg aaaaacatca nattgaacgc   480

cannaangnn t   491

<210> 175
<211> 545
<212> DNA
<213> Gossypium arboreum

<220>
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<222> (528)..(528)
<223> n is a, c, g, or t

<220>
<221> misc_feature

-197-

<222> (536)..(536)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (540)..(540)
<223> n is a, c, g, or t

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tcaccgcctt gataaattgc cagaggttct ggatggtcaa atgttgaaga catggacaga   120

tcgtgcagcc gaaatcgctc agcttggttg ggtatatgaa tatagtctac tgaacatggc   180

cattgacagt gttacccttt cactagatgg ccagcgagct gtagtcgaag ctactctgga   240

agaatccacc tgcttgactg atgttcatca tccggagaac aatgcctcta atgtaaactc   300

ctacaccacg agatatgaga tgtcttgttc caactcaggc tggaaaatca ctgaaggatc   360

tgtctacaaa tcttaactat gatgtataaa gcataaaaag cctgaaagct ccaatgtggt   420

taccagcttt gcctttttac gtagctatat ttgttatatt gtttgagaaa acaagagtta   480

gcgttttcca gtcatgcaag cagttcaaat taaaagaggc aatgcttntc atgganaacn   540

aaatg   545

<210> 176
<211> 420
<212> DNA
<213> Hordeum vulgare

<400> 176
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tggcagagca tcaaatccaa ggccttggga tcagatcatt ctgttgcatc attgcaagag   120

gttcttgatg gcaacatgct gaaggtatgg acagaccgag cagcagagat tgagcgcaaa   180

ggctggttct gggactacac gctgttcaac gtggcgatcg acagcatcac cgtctccctg   240

gacggacggc gggcgaccgt ggaggcgaca attgaggagg cgggtcagct caccgacgca   300

accgacccca ggaacgatga tttgtacgac actaagtaca ccacccggta cgagatggcc   360

ttcaccggac caggagggtg gaagataacc gaaggcgcag tcctcaagtc gtcatagggc   420

<210> 177
<211> 606
<212> DNA
<213> Triticum aestivum

<400> 177

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ctgcaaatct agcactatgt ttctctttat ctccaggatc tagcctagca ccaacaatcc     60

aaatacaaca caagaaaaat aaagctcttc gtcgatcaca tcagactaac gcaactatcg    120

gtcttccaaa ctaaaaaggg cctagactgc ctgcttattt acacacccc aaaagaaaac    180

tggaaggaat taacaaactt aatgaggtta ccgcacacca actaccctaa gacgacttga    240

ggaccgcgcc ttccattatc ttccaccctc ctagtccggt gaaggtcatc tcataccggg    300

tggtgtactt cgtgtcgtac gagtcgttgt tcttggggtc ggttgcgtcg atgagctggc    360

ctgcctcctc gatcgttgcc tccacggtcg cccgccgtcc gtccagggag accgtgatgc    420

tgtcgatcgc cacgtcagac agtgtgtagt cccagaacca gcctttgcgc ccgatctccg    480

ctgctcggtc cgtccatacc ttcagcatgt tgccatcaag aacctcttgc aatgattcca    540

cagaatgatc tgatcccaag gccttggttt tgatactctg ccacttgcga acaatatctt    600

ctgcca                                                               606
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<210> 178
<211> 563
<212> DNA
<213> Gossypium arboreum

<400> 178

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tttttttttt tttttttttt tttttttttt tttttttaa cttgcctctt ttaatttgaa     60

ctgcttgcct gactggaaaa ccctaactct tgttttctca acaatttaa caaatatagc    120

tccctaaaaa ggcaaagctg gtaaccacat tggagctttc aggcttttta tgctttatac    180

atcatagtta aaatttgtag acagatcctt cagtgatttt ccaacctgag ttggaacaaa    240

acatctcata tttcgtgggg taggagttta cattacaggc attgttctcc ggatgatgaa    300

cattactcaa gccgggggggt tcttccaaaa taacttcgac tacagctcgc tggccattta    360

atgaaagggt aacactgtca atggccctgt tcagtcaact ttattcatat acccaaccca    420

gctgaccgat ttcggctgca ccaactgtcc atgttttcaa catttgacca tccaaaacct    480

ttggcaattt atcaaggggg ggatcaagtc caaacgcctc agatttaatg ttctgccact    540

tgcgaacaat gccttttgca att                                            563
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<210> 179
<211> 360
<212> DNA
<213> Hordeum vulgare

<400> 179
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tggcagagca tcaaatccaa ggccttggga tcagatcatt ctgttgcatc attgcaagag   120

gttcttgatg gcaacatgct gaaggtatgg acagaccgag cagcagagat tgagcgcaaa   180

ggctggttct gggactacac gctgttcaac gtggcgatcg acagcatcac cgtctccctg   240

gacggacggc gggcgaccgt ggaggcgaca attgaggagg cgggtcagct caccgacgca   300

accgacccca ggaacgatga tttgtacgac actaagtaca ccacccggta cgagatggcc   360

<210> 180
<211> 300
<212> DNA
<213> Hordeum vulgare

<400> 180
tgatggcaac atgctgaagg tatggacaga ccgagcagca gagattgagc gcaaaggctg   60

gttctgggac tacacgctgt tcaacgtggc gatcgacagc atcaccgtct ccctggacgg   120

acggcgggcg accgtggagg cgacaattga ggaggcgggt cagctcaccg acgcaaccga   180

ccccaggaac gatgatttgt acgacactaa gtacaccacc cggtacgaga tggccttcac   240

cggaccagga gggtggaaga taaccgaagg cgcagtcctc aagtcgtcat agggcgttca   300

<210> 181
<211> 549
<212> DNA
<213> Triticum monococcum

<400> 181
tttttttttt tttttttttt tttttttttca gcggcaaatt cagcactatg tttctcttat   60

ccccaactca aagatcttct aagctagcaa taatccgaaa acgacacagg gaaaaacaaa   120

gctcatcgct gattgcacat cagactaacc aaactatctc caacttccaa actgagaagg   180

gcctagactg cttatttaca caccaaaaag aacacgggag gaatcaatca acaaaggtct   240

actgcacacc gaacgcccta tgacgacttg aggaccgcac cttctgttat cttccaccct   300

cctggtccag tgaaggtcat ctcgtaccgg gtggtgtact tagtgtcgta caaatcgttg   360

ttcctggggt cggttgcatc ggtaagctgg cctgcctcct caattgtcgc ctccacagtc   420

gcccgtcgtc cgtccaggga cacggtgatg ctgtcaatcg ccacgtcgga cagcgtgtag   480

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ttgccatca   549

-200-

<210> 182
<211> 573
<212> DNA
<213> Hordeum vulgare

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<222> (6)..(6)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (16)..(16)
<223> n is a, c, g, or t

<400> 182
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gcttctcttt gaacaggagt acgcaggaag caccagggcc aaggttccgc ccagatcctc   180

tcttcatata ccctggagct ggttgcctgc tgccttgtgt gtcttgcagg aggttgggga   240

agagaagctg gtcttggaca ttggtcaggc agctctacga cgccctgatt ctaagccata   300

tgctcacgat gtacttcttg caatggcact agctgaatgc tccattgcaa aagctagctt   360

tgaaaaaagt aaagtatctc ttggctttga ggctctagca cgtgctcaat atcttttgag   420

gaaaaaacca tctttagaga agatgcctct tcttgagcag atcgaagaat cacttgaaga   480

gcttgcacca gcttgcactc tagaggtttt aagcctgccc cgtacacctg aaaattctga   540

acgcaggcgt ggtgctattg cagctctctg tga   573

<210> 183
<211> 400
<212> DNA
<213> Beta vulgaris

<400> 183
gcataacacg gcaagaagat gttgcagtta atggctttgg aaatgaggat gttacaatgg   60

agcttggccg tgataacact ttagattatg tgaatttagc cagttcaaat tttactgaag   120

ataatatcga gcaagaatcg gttactgaga agataaaaga tttaggtgtg aaggttatgt   180

gtgccggtgt ggtgattgga ctgacaactt tggctggcat gaaacttttg cctggcagaa   240

gtgggtctgc cattccacac aggcatcttg gttctgctgt ggcttctgat gtctccagtg   300

tggggctctc agtaaatgaa actactgagg agaaagtacc aaaaatggat gcaagacttg   360

cagaagttct agttagaaga tggcagaacg ttaaatcaca   400

<210> 184
<211> 631
<212> DNA
<213> Prunus persica

<220>
<221> misc_feature
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<223> n is a, c, g, or t

<400> 184
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catatgactg cagctgagca ggttgattta tttgtagcta cccccagtaa tatcccggca   120

gaaagctttg aagtttatgg ggtggctctt gcgcttgttg ctcaagcctt tgttggtaaa   180

aaacctcatc acattcaaga tgctgaaaac ctattccaga aacttcagca gtctaaggta   240

acagctgtag acattctct tgacaactat ataaccaaag aaagcagtga gatagacttt   300

gctttggaga ggggactctg ttcacttctt ctaggggacc ttgatgacag tcgttcgtgg   360

ttgggcctag acagtaatga ttcaccatat agaaatccat ctgttgtaga ctttgtcttg   420

gagaactcaa aggatgacga tgacaatgac aatgacaatg atcttcctgg actttgcaag   480

ctattggaga cgtggttgat ggaggtggta ttccccaggt ttagagacac caaagacata   540

gagttcagac tgggagacta ctatgatgat cctacagtct tgagatactt agaaaggctg   600

gatggcacta atggttcacc cttagctgct g   631

<210> 185
<211> 647
<212> DNA
<213> Helianthus annuus

<400> 185
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aatgtggagg attctagggt tgaggatgct gaagacattc ctaaaatgga tgcaagatta   180

gccgaaggtc tagttcgtaa gtggcagagc ataaaatccc aagcccttgg acctgagcat   240

tgccactcaa aattatcata ggtattagat ggtgaaatgc acaagatctg gcttcaacgg   300

gcaaccgaaa ttgctcaacg tggttggttt tgggactaca cgcttttaaa cattaccatt   360

gacagtgtta ccgtttcact cgatgggcgc ttagctgttg tggaagcaac ccttgaagag   420

tctgccaagt tgattgattt gacccacccg gaaaacaatg actcctataa tttaacttac   480

accacacgtt atgagatgtc gtgtgccaag tcatcatgga aaatcacaaa gggggctgtc   540

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ctcaaatcat aacagatgta attctttctc acctttтctg tatttatctg ttattagatt        600

actcagcagt tgaatgatat gtttctccac catttcgatc atgagcg                      647


<210>    186
<211>    652
<212>    DNA
<213>    Helianthus annuus

<400>    186
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tactagtact actgctcgta aagaagttga ttcggctctg gcttcagacg tcaccaatag        120

gattctaggg ttgaggatgc tgaagacatt cctaaaatgg atgcaagatt agccgagggt        180

ctagttcgta agtggcagag cataaaatcc caagcccttg gacctgagca ttgccactca        240

aaattatcag aggtattaga tggtgaaatg cacaagatct ggcttcaacg ggcaaccgaa        300

attgctcaac gtggttggtt ttgggactac acgcttttaa acattaccat tgacagtgtt        360

accgtctcac tcgatgggcg cttagctgtt gtggaagcaa cccttgaaga gtctgccaag        420

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tatgagatgt cgtgtgccaa gtcttcatgg aaaatcacaa aggggctgt cctcaaatca        540

taacagatgt aattctttct cacctttтct gtatttaact gttattagat tactcagcag        600

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<210>    187
<211>    460
<212>    DNA
<213>    Populus tremula

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ctgactttag ctggcctgaa gtgttttcct cctaggactg gctccttcat tcgacagaaa        120

gaaattggtt cggcaatggc atctgacacc atcaatttga attcagcagt agatgaacaa        180

atttccgagg acttacccag aatggatgca aggggtgcag aggatatagt cgcaagtgg        240

caaaacatta aatctcaggc ttttggaact gatcactgcc tggcaaaatt gccagaggtt        300

ttggatagtc agatgttgaa aatatggaca gatcgtgcgg ccgaaattgc acatcttggt        360

tgggtatacg agtatatgct gttggacctg actattgaca gtgtgactgt atctgtagat        420

ggcctaaatg ctgtagtaga agcaacactc aaagagtcaa                              460
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<210> 188
<211> 3933
<212> DNA
<213> Chlamydomonas reinhardtii

<400> 188
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cgcgtaagcc gccctgacgc cattcgcaag gcgtatgaga acctggtgaa gcaacccccc   120

gctgccgcgt actctgcgga caccctcttc gcacgcgcgg tgctactcaa ggcagccgcg   180

gagtcgctga ccgacccgga cctgcgccgc tcatatgacg ccaagctggc cgctggtcac   240

acagccctgc gcgtcagcca gcaggaccta cccggagccc ttgtcgtgct gcaggaggtg   300

agccgtgctc tggcgaccgc tcaacccctt gcgaccgcta aaaccatcag cacatatagc   360

acatataaat tcccatgggt tctgtactac cgcccacccc tctgaagggg gcgagtattc   420

attcttcacg catgagcgca gactttTacc ctatcaagtc ccgccctcgc ccgccttctc   480

ttcccacaga tcggcgagca ccagttggtt ctggatctgg gtctgcgctg gctagaggta   540

aacggcggcc agcccgacgc cggcgacgtg gccgctgccg tggccctggc ctactgtgac   600

cgcgctggtg agcgcctcac ctcccagctg cagccgccgc cggcctcagc gctgccaggc   660

cccgatggcg cggcggtgcc gcacgcgcac gtgggcgcgg tgctgcccgc atgcgacgac   720

ctggacgcag cgctgagcaa gctccggcgg tacggcatgg cgcagcagct gcagcagcag   780

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gtagacacag ggatgtaggc gtcgatgcga ggggatggaa gtatggggtc ctgtgagtgt   900

gagccgatgg aaggtataga tgctgggagc tggcgcaccc gacccatgtc atccaaggac   960

ttggctgatg catcgctcac ccccccgcctc caacccgaat gccctcagga cctggcgcca   1020

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accctcactt gcgacctcaa tgcgtgcacc ttagccgctc ctcctgcaac cctcagttgc   1560

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gacctcacga cacaccgtct ggcttacccc tgcccccacc ccaggtggcc ctgctgccgg   1620

acgcgctgcg cggcagcggt gtgtcgccca ccccggacgc gctgtacgac ggcgccctgg   1680

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ggccgccgcc gccgcagccc gccgtgccat gtacagcggt cccgccgccg cccacggtcc   2040

caccctgtac accaactaca acaaccctgc cggcagcggc aatggcgcgc cgccgccgcc   2100

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ggcggcgcat gtgcactcca cggcgatggc ggagcacgcg gcgcgcagcg cggctggcgg   2220

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ccgcctcttc ctttgaggag ggcgccgctg aggccgctga cctgcgtcgt cgctttgtcg   3300
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ccaccagccg cggcgccagc gcggccgtcg gtgcgcccac agcaccagcc gctatgactg    3360

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ccaacaaggc tgttgaccaa gctgctgctg cccttgcact ctttcaacgc ccgtctgcag    3780

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<210>    189
<211>    2511
<212>    DNA
<213>    Chlamydomonas reinhardtii

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accgtggccg ccgccacagc caagcccgag gctgctgctg acgacagcga cgacgacgag    780

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cccacccggg   acgcgctgta   cgacggcgcc   ctggcgcacc   tggtggacgg   cttccgcaac        960

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gccgccgcag   tcaccggccc   cgccctcggc   cgtggcgctg   cagcttccgc   ctcttccttt       2040

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cgcaacgacg   gcgccgcctc   cgccctggca   cccgccgccg   tcaccaccgc   ctccgtggcc       2460

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<210> 190
<211> 836
<212> PRT
<213> Chlamydomonas reinhardtii

<400> 190

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            20   25   30

Glu Asn Leu Val Lys Gln Pro Pro Ala Ala Ala Tyr Ser Ala Asp Thr
        35   40   45

Leu Phe Ala Arg Ala Val Leu Leu Lys Ala Ala Ala Glu Ser Leu Thr
    50   55   60

Asp Pro Asp Leu Arg Arg Ser Tyr Asp Ala Lys Leu Ala Ala Gly His
65   70   75   80

Thr Ala Leu Arg Val Ser Gln Gln Asp Leu Pro Gly Ala Leu Val Val
            85   90   95

Leu Gln Glu Ile Gly Glu His Gln Leu Val Leu Asp Leu Gly Leu Arg
            100   105   110

Trp Leu Glu Val Asn Gly Gly Gln Pro Asp Ala Gly Asp Val Ala Ala
            115   120   125

Ala Val Ala Leu Ala Tyr Cys Asp Arg Ala Gly Glu Arg Leu Thr Ser
    130   135   140

Gln Leu Gln Pro Pro Pro Ala Ser Ala Leu Pro Gly Pro Asp Gly Ala
145   150   155   160

Ala Val Pro His Ala His Val Gly Ala Val Leu Pro Ala Cys Asp Asp
            165   170   175

Leu Asp Ala Ala Leu Ser Lys Leu Arg Arg Tyr Gly Met Ala Gln Gln
            180   185   190

Leu Gln Gln Gln Ile Val Gly Ala Leu Arg Asp Leu Ala Pro Glu Tyr
            195   200   205

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Ala Cys Glu Leu Ala Ala Leu Pro Leu Gly Ala Glu Thr Ala Ala Arg
    210   215   220

Arg Ala Lys Gly Val Ala Leu Met Arg Gly Val Leu Arg Ala Ala Ala
225   230   235   240

Thr Val Ala Ala Ala Thr Ala Lys Pro Glu Ala Ala Ala Asp Asp Ser
            245   250   255

Asp Asp Asp Glu Val Asp Pro Arg Ser Val Leu Ala Ala Ala Arg Arg
            260   265   270

Met Leu Thr Arg Ser Arg Asp Val Leu Thr Cys Ser Glu Gln Val Ala
        275   280   285

Leu Leu Pro Asp Ala Leu Arg Gly Ser Gly Val Ser Pro Thr Pro Asp
    290   295   300

Ala Leu Tyr Asp Gly Ala Leu Ala His Leu Val Asp Gly Phe Arg Asn
305   310   315   320

Gly Trp Pro His Ser Val His Gln Ala Asp Gln Leu Leu Ala Lys Leu
            325   330   335

Glu Ala Gln Gln Ala Arg Ala Ala Ala Met Arg Arg Glu Gln Ser Glu
        340   345   350

Leu Ala Ala Ala Ala Ala Ala Arg Arg Ala Met Tyr Ser Gly Pro Ala
    355   360   365

Ala Ala His Gly Pro Thr Leu Tyr Thr Asn Tyr Asn Asn Pro Ala Gly
    370   375   380

Ser Gly Asn Gly Ala Pro Pro Pro Pro Arg Pro Met Pro Met Val
385   390   395   400

Pro Arg Gly Asp Gly Gln His Ala Met Ala Ala Ser Val Ala Ala His
            405   410   415

Val His Ser Thr Ala Met Ala Glu His Ala Ala Arg Ser Ala Ala Gly
        420   425   430

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Gly Ala Ala Gly Ala Ser Asp Gly Gly Ala His Ala Asn Gly Val Ala
        435             440             445

Leu Glu Arg Ala Val Cys Ala Val Leu Leu Gly Asp Tyr Thr Ala Ala
    450             455             460

Val Glu Arg Leu Gly Leu Asp Thr Asn Ala Ala Val Glu Gln Glu Gln
465             470             475             480

Leu Arg Glu Phe Val Leu Ala His Ser Pro Asn Gly Arg Gly Asp Leu
            485             490             495

Arg Pro Gly Leu Arg Ala Leu Ala Thr Arg Trp Leu Glu Gly Val Ala
        500             505             510

Leu Ala Ser Phe Arg Asp Thr Ala Gly Ser Pro Val Pro Pro Leu Glu
        515             520             525

Ala Ser Trp Phe Ala Asp Leu Arg Val Ala Phe Tyr Leu Gln Val Trp
    530             535             540

Arg Leu Cys Arg Val Glu Gln Val Leu Ala Ala Ala His Phe Leu Ala
545             550             555             560

Asn Leu Leu Pro Asn Met Leu Lys Ala Ile Ala Gly Thr Ala Val Lys
            565             570             575

Val Ala Ala Asn Thr Ala Val Ala Ala Ser Arg Ala Gln Arg Leu Ser
            580             585             590

Ala Thr Val Ala Ala Ser Thr Ala Thr Ala Ser Ser Ser Ser Ser Ala
        595             600             605

Ala Arg Gly Ala Arg Ala Gly Ala Leu Ser Ala Ala Thr Ala Ala Ala
        610             615             620

His Ala Ala Arg Arg Gln Gln Ala Asn Ala Val Gly Ala Ser Ile Val
625             630             635             640

Gly Ala Asp Val Leu Pro Pro Thr Ala Val Ala Ala Ala Ala Ala Ala
            645             650             655

Gly Thr Ala Ala Ala Ala Ala Val Thr Gly Pro Ala Leu Gly Arg Gly
            660             665             670
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Ala Ala Ala Ser Ala Ser Ser Phe Glu Glu Gly Ala Ala Glu Ala Ala
        675             680             685

Asp Leu Arg Arg Arg Phe Val Ala Thr Ser Arg Gly Ala Ser Ala Ala
        690             695             700

Val Gly Ala Pro Thr Ala Pro Ala Ala Met Thr Gly Pro Gln His Gly
705             710             715             720

Ala Ala Ser Ala Ala Gln Ser His Arg Glu Glu Asp Glu Asp Ser His
        725             730             735

Gly Gly Gln Glu Gly Gly Val Pro Arg Arg Met Ser Glu Ala Asp Leu
        740             745             750

Arg Ala His Leu Ala Gly Leu Glu Lys Ala Met Trp Asp Ser Glu Leu
        755             760             765

Pro Pro Pro Pro Pro Ser Arg Ala Gln Lys Ala Leu Thr Tyr Ala Ala
        770             775             780

Gly Leu Leu Ala Val Val Val Ala Phe Leu Val Ser Ser Phe Phe Arg
785             790             795             800

Arg Asn Asp Gly Ala Ala Ser Ala Leu Ala Pro Ala Ala Val Thr Thr
            805             810             815

Ala Ser Val Ala Val Ser Ala Gln Pro Ala Lys Pro Gly Lys Ala Thr
            820             825             830

Arg Ser Ala His
        835


<210>  191
<211>  2022
<212>  DNA
<213>  Thermosynechococcus elongatus

<400>  191
gtgcgcattc ccctcgatta ttaccaagtg ttgggtgtgc ctattcaggc aacgccggag    60

caaattgagc aggcctttcg ggaccggctg ttgcagctcc ctacccatca gcactccccc   120

accacagttg ccacccgtcg cgaactcatt gagcaggcct atgcagtttt gcgagaaccg   180

gagcagcgcg atgcctacga tcgccactgc cgtaccgttg atcccgatga tttgattgcc   240
```

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```
cagttggatc ccgatgccac cactccccac attgaaatta gtgatgagca attgtcgggg    300

gcactcctac tgctgtatga actaggaaat tatgcccaag ttgtcaacct gggagacgcc    360

tttcttaaaa aggatgtttt tgagcgcaat cgcccctaca cttcccctgc cgccgttgcc    420

gacattaccc tcactgtggc tttggcctat ctggaattgg dacgggagga atggcagcgg    480

cagtcctatg aatcagccgc ctctcagcta gaagccggtc tccaggtact tcagcgggta    540

aatttgtttc ccgagctcca ggagcagttt cagacggaac tgaatcggct gcgtccctac    600

cgcattctgg aattactggc actgcctttg tccgatagtg cgaatcggca gcggggtatt    660

ttattgctgc ggcaaatgct gagtgagcgc gggggcattg aggggcgcgg tgacgatcgc    720

tcaggactaa cagttgagga ttttctgaaa tttattttgc aactgcgcag ccatcttacc    780

gtggcagaac aacaggaact ctttgaacgg gaatcgcggc gtccctcagc ggtggccacc    840

taccttgcgg tacatgcctt ggtagcacgg ggagtgcatg aactgcagcc gagctatatt    900

tgtcgggcca aggatttatt gcagcagctg ctcccccatc aagacgtcta tcttgaactt    960

gccagttgct tgctgctttt gggacagccc accgaggcct tggcagctct tgaccacagc    1020

caagatcaac cgactctgga ctttatccgc cgtcatgccg gtgaggctgg cgatcgactg    1080

ccggggcttt attactacac cacacaatgg ctcacggagg aaatttatcc tgcatttcgg    1140

gacttggggg aaacacccgt ggccttggag gcttactttg ctgatgccaa tgtccaaacc    1200

tatctagagg ctctcagtga ggactccatt gcccctgaac cccctgcgac cactgcctct    1260

gcgctccctg aagtgatcag accaacggtg gccgtgcccc ctcccctctc cttcacagcg    1320

gaaacgttac cgttgcagga tcagagtcgg ctgggtcagg gcctttcggc atcggctttt    1380

accccttctg caactgcaac ggggacatcg atgccccaac catcgcctcg caaacggcgc    1440

agccctcgaa accgttgcgc ccaaaaacgt cagacttggt tttggatggg tgcaggagtg    1500

gttcttgtgg gtttaggggc gttggcaaaa gtctattggc ccgccaaaac cgctgaagcc    1560

ccccgccgc cggtgacacc ggcaccaact cctgtggcaa cgccgacccc aacgccacaa    1620

ccgacgacct tagccatcac tttaacacca gagatggcgc gcgatcgcct ccacacttgg    1680

cagcaaatta aagcccaagc ccttgggcga ccatttgagg tggacaaact aacaacgatt    1740

ttggcggagc cagaactcag ccgctggcga tcgcgggcac agggcttaaa gtccgagggc    1800

agctattggg tttataccct aaagaactta gaagtgaagg aagtccgcct ccaaaggagc    1860
```

-212-

gatcgtgtgg aggtgttggc agaagtcaac gaggatgccc gtttctatga acagggaacc   1920

ctgcgcactg atatttccta tagcgatccc taccgggtca tttatacctt tatccgtcgc   1980

ggcaatcaat ggttgattca aggcatgcag gtggttagtt aa   2022

<210> 192
<211> 673
<212> PRT
<213> Thermosynechococcus elongatus

<400> 192

Met Arg Ile Pro Leu Asp Tyr Tyr Gln Val Leu Gly Val Pro Ile Gln
1   5   10   15

Ala Thr Pro Glu Gln Ile Glu Gln Ala Phe Arg Asp Arg Leu Leu Gln
                20   25   30

Leu Pro Thr His Gln His Ser Pro Thr Thr Val Ala Thr Arg Arg Glu
            35   40   45

Leu Ile Glu Gln Ala Tyr Ala Val Leu Arg Glu Pro Glu Gln Arg Asp
        50   55   60

Ala Tyr Asp Arg His Cys Arg Thr Val Asp Pro Asp Asp Leu Ile Ala
65   70   75   80

Gln Leu Asp Pro Asp Ala Thr Thr Pro His Ile Glu Ile Ser Asp Glu
                85   90   95

Gln Leu Ser Gly Ala Leu Leu Leu Leu Tyr Glu Leu Gly Asn Tyr Ala
                100   105   110

Gln Val Val Asn Leu Gly Asp Ala Phe Leu Lys Lys Asp Val Phe Glu
            115   120   125

Arg Asn Arg Pro Tyr Thr Ser Pro Ala Ala Val Ala Asp Ile Thr Leu
        130   135   140

Thr Val Ala Leu Ala Tyr Leu Glu Leu Gly Arg Glu Glu Trp Gln Arg
145   150   155   160

Gln Ser Tyr Glu Ser Ala Ala Ser Gln Leu Glu Ala Gly Leu Gln Val
                165   170   175

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```
Leu Gln Arg Val Asn Leu Phe Pro Glu Leu Gln Glu Gln Phe Gln Thr
        180                 185             190

Glu Leu Asn Arg Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala Leu
        195                 200             205

Pro Leu Ser Asp Ser Ala Asn Arg Gln Arg Gly Ile Leu Leu Leu Arg
        210                 215             220

Gln Met Leu Ser Glu Arg Gly Gly Ile Glu Gly Arg Gly Asp Asp Arg
225                 230             235                 240

Ser Gly Leu Thr Val Glu Asp Phe Leu Lys Phe Ile Leu Gln Leu Arg
                245             250             255

Ser His Leu Thr Val Ala Glu Gln Gln Glu Leu Phe Glu Arg Glu Ser
        260                 265             270

Arg Arg Pro Ser Ala Val Ala Thr Tyr Leu Ala Val His Ala Leu Val
        275             280             285

Ala Arg Gly Val His Glu Leu Gln Pro Ser Tyr Ile Cys Arg Ala Lys
    290             295             300

Asp Leu Leu Gln Gln Leu Leu Pro His Gln Asp Val Tyr Leu Glu Leu
305             310             315                 320

Ala Ser Cys Leu Leu Leu Leu Gly Gln Pro Thr Glu Ala Leu Ala Ala
            325             330                 335

Leu Asp His Ser Gln Asp Gln Pro Thr Leu Asp Phe Ile Arg Arg His
            340             345             350

Ala Gly Glu Ala Gly Asp Arg Leu Pro Gly Leu Tyr Tyr Tyr Thr Thr
            355             360             365

Gln Trp Leu Thr Glu Glu Ile Tyr Pro Ala Phe Arg Asp Leu Gly Glu
    370             375             380

Thr Pro Val Ala Leu Glu Ala Tyr Phe Ala Asp Ala Asn Val Gln Thr
385             390             395                 400

Tyr Leu Glu Ala Leu Ser Glu Asp Ser Ile Ala Pro Glu Pro Pro Ala
            405             410             415
```

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```
Thr Thr Ala Ser Ala Leu Pro Glu Val Ile Arg Pro Thr Val Ala Val
        420         425                 430

Pro Pro Pro Leu Ser Phe Thr Ala Glu Thr Leu Pro Leu Gln Asp Gln
        435         440                 445

Ser Arg Leu Gly Gln Gly Leu Ser Ala Ser Ala Phe Thr Pro Ser Ala
        450         455                 460

Thr Ala Thr Gly Thr Ser Met Pro Gln Pro Ser Pro Arg Lys Arg Arg
465             470                 475                 480

Ser Pro Arg Asn Arg Cys Ala Gln Lys Arg Gln Thr Trp Phe Trp Met
            485                 490                 495

Gly Ala Gly Val Val Leu Val Gly Leu Gly Ala Leu Ala Lys Val Tyr
            500                 505                 510

Trp Pro Ala Lys Thr Ala Glu Ala Pro Pro Pro Val Thr Pro Ala
        515                 520                 525

Pro Thr Pro Val Ala Thr Pro Thr Pro Thr Pro Gln Pro Thr Thr Leu
        530                 535                 540

Ala Ile Thr Leu Thr Pro Glu Met Ala Arg Asp Arg Leu His Thr Trp
545                 550                 555                 560

Gln Gln Ile Lys Ala Gln Ala Leu Gly Arg Pro Phe Glu Val Asp Lys
                565                 570                 575

Leu Thr Thr Ile Leu Ala Glu Pro Glu Leu Ser Arg Trp Arg Ser Arg
                580                 585                 590

Ala Gln Gly Leu Lys Ser Glu Gly Ser Tyr Trp Val Tyr Thr Leu Lys
        595                 600                 605

Asn Leu Glu Val Lys Glu Val Arg Leu Gln Arg Ser Asp Arg Val Glu
        610                 615                 620

Val Leu Ala Glu Val Asn Glu Asp Ala Arg Phe Tyr Glu Gln Gly Thr
625                 630                 635                 640
```

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Leu Arg Thr Asp Ile Ser Tyr Ser Asp Pro Tyr Arg Val Ile Tyr Thr
            645   650   655

Phe Ile Arg Arg Gly Asn Gln Trp Leu Ile Gln Gly Met Gln Val Val
            660   665   670

Ser

<210> 193
<211> 2370
<212> DNA
<213> Trichodesmium erythraeum

<400> 193
gtgcggattc cattagatta ttatcgaatt ttaggtttac caattcaggc tactgctgaa   60

cagttgcggc aggcacatca agaccgcact cagcagtttc ctagaaggga gtattctgaa   120

gccacaatag ttgctcgtaa acagcttata gatgaggctt atgctgttct ttgcgatcct   180

gaacaacgtc aaacctatga tggtaacttt ttagctaaaa cctacgagcc aatagtagaa   240

gaactcaatc caagttctca gataaatttt gatcaagcac aagaaaaga aaccacactt   300

aaggagacta gagaagttct tccggaaata gcttctaaac agttaaaaa aaggacaagt   360

tatcaaaaca gagagactaa agctgcctct gattttcatt ctaatacccc tagtatagaa   420

atagaatatc cacaatttgt gggagccatc ctaattttac atgagctagg agaatatgag   480

ctagtattaa aaataactca cccttatctt cttaacaata gtataactat aaagatgga   540

cgttttggag acccagcatt agttttgcca gatgttgtcc ttacagttgc tctagcaaat   600

ttagaattgg gcagagagga atggcaacaa ggacaatacg aaagtgcagc tacagcttta   660

gaggctggcc tagggttatt gctacgagaa aacctatttg tccaaatacg aggagagata   720

caagctgacc tttataagct acgtccttat agaataatgg agctaatagc actaccagag   780

gaaatagctc tagaccgtag ccgtggacta gaaattcttc aagatatgct caatgaacgg   840

ggaggaattg atggtcaagg tgaagatagc tctggacttg ggatagaaga ttttctaaag   900

tttgttcagc agctacgtca atacttaact acagcagagc aaaagaagtt atttgaggca   960

gaagccccttc gcccttccgc agttggtgca tatctagcgg tttatacttt tttagctcaa   1020

gggtttgctc aaaaacaacc agcctttatt cgtaaagcta agttgatgtt aatgcaattg   1080

ggtcggagtc aagatgtaaa tttagagaaa tctgtctgtg ctttactttt agggcaaact   1140

gaagaagcta gtcgttcatt agaacttagc catgaaaatg aacctctatc ctttattaaa   1200

-216-

```
gaaaattctc aacaatctcc agatttattg ccaggtctat gtctctatgc tgaacattgg      1260

ttgacagagg aggttttttcc acatttccgt gatttgtctg acaagtcagc ttctttgaaa      1320

gattattttg cagatcaaca tgttcaagct tatctagaag ctttacctac agaagcagag      1380

gtagctaatc aatgggtagt cgttcagcct cgtcgtagta atcacaataa aaaacaaatg      1440

ttcgacccca aggaacttga gaagttgaat gtatcagatt tggaggataa agatatttct      1500

cgggtagatg ctactgctac tggtattgtt gcttctggaa gtcaaggaag ttctaattta      1560

ctaggggcta gttctgatgg gttgcttcaa gaattagaaa aatcatcatc tactagaggt      1620

gggccaaaac aagtaactac taagagttct agtcactatt taggaaaaat tagggaaaag      1680

agtataagtg gtttacctga gtttaatgaa agtacatcta ttgagagtgg ggggttaccc      1740

caatctatcc aagagcatag ttcacgtaga acttctgcta gaagagaacc tgttaagttt      1800

ggtcgtttaa tattaatcgc aattgtggga tttttgttaa taggatttat tgggttgtta      1860

acaattaaaa ctatcggctg gttagtaaat gctttaggat gggaaagaga aaaactgatg      1920

atacaattgg ataggcctcc tatagaaatc ccagaacctg atcgggttaa cctcgcagca      1980

tcaggaccga taacaaaaga agtagcaagg cgaacaattc aaagttggtt agatatcaag      2040

gcttctgctc ttggtcctaa tcataaaatt gaacaattac caaatatttt agtagaaccg      2100

gcactttctc gttggttacc tacagctaat gccctgaagc aagaaaagtc ataccgtagg      2160

tatgagcatg atttagaaat aagtaatata aagatgagta atacaaattc taatctcgct      2220

caagtagatg ctaaagtgat agaaaaggta gagtttttatt ctgacaatgg tagattaact      2280

aatactaaca atgaaaactt atttgttcgt tatgatttag ttcgtaaaag tcaaaaatgg      2340

caaattagta attggaaggt attgagataa                                      2370
```

<210>   194
<211>   789
<212>   PRT
<213>   Trichodesmium erythraeum

<400>   194

Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Ile Gln
1   5   10   15

Ala Thr Ala Glu Gln Leu Arg Gln Ala His Gln Asp Arg Thr Gln Gln
            20   25   30

Phe Pro Arg Arg Glu Tyr Ser Glu Ala Thr Ile Val Ala Arg Lys Gln
        35   40   45

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Leu Ile Asp Glu Ala Tyr Ala Val Leu Cys Asp Pro Glu Gln Arg Gln
    50   55   60

Thr Tyr Asp Gly Asn Phe Leu Ala Lys Thr Tyr Glu Pro Ile Val Glu
65   70   75   80

Glu Leu Asn Pro Ser Ser Gln Ile Asn Phe Asp Gln Ala Gln Glu Lys
                85   90   95

Glu Thr Thr Leu Lys Glu Thr Arg Glu Val Leu Pro Glu Ile Ala Ser
                100   105   110

Lys Gln Leu Lys Lys Arg Thr Ser Tyr Gln Asn Arg Glu Thr Lys Ala
        115   120   125

Ala Ser Asp Phe His Ser Asn Thr Pro Ser Ile Glu Ile Glu Tyr Pro
    130   135   140

Gln Phe Val Gly Ala Ile Leu Ile Leu His Glu Leu Gly Glu Tyr Glu
145   150   155   160

Leu Val Leu Lys Ile Thr His Pro Tyr Leu Leu Asn Asn Ser Ile Thr
            165   170   175

Ile Lys Asp Gly Arg Phe Gly Asp Pro Ala Leu Val Leu Pro Asp Val
            180   185   190

Val Leu Thr Val Ala Leu Ala Asn Leu Glu Leu Gly Arg Glu Glu Trp
        195   200   205

Gln Gln Gly Gln Tyr Glu Ser Ala Ala Thr Ala Leu Glu Ala Gly Leu
    210   215   220

Gly Leu Leu Leu Arg Glu Asn Leu Phe Val Gln Ile Arg Gly Glu Ile
225   230   235   240

Gln Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg Ile Met Glu Leu Ile
            245   250   255

Ala Leu Pro Glu Glu Ile Ala Leu Asp Arg Ser Arg Gly Leu Glu Ile
            260   265   270

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Leu Gln Asp Met Leu Asn Glu Arg Gly Gly Ile Asp Gly Gln Gly Glu
        275   280   285

Asp Ser Ser Gly Leu Gly Ile Glu Asp Phe Leu Lys Phe Val Gln Gln
        290   295   300

Leu Arg Gln Tyr Leu Thr Thr Ala Glu Gln Lys Lys Leu Phe Glu Ala
305   310   315   320

Glu Ala Leu Arg Pro Ser Ala Val Gly Ala Tyr Leu Ala Val Tyr Thr
              325   330   335

Phe Leu Ala Gln Gly Phe Ala Gln Lys Gln Pro Ala Phe Ile Arg Lys
        340   345   350

Ala Lys Leu Met Leu Met Gln Leu Gly Arg Ser Gln Asp Val Asn Leu
        355   360   365

Glu Lys Ser Val Cys Ala Leu Leu Leu Gly Gln Thr Glu Glu Ala Ser
        370   375   380

Arg Ser Leu Glu Leu Ser His Glu Asn Glu Pro Leu Ser Phe Ile Lys
385   390   395   400

Glu Asn Ser Gln Gln Ser Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr
              405   410   415

Ala Glu His Trp Leu Thr Glu Glu Val Phe Pro His Phe Arg Asp Leu
              420   425   430

Ser Asp Lys Ser Ala Ser Leu Lys Asp Tyr Phe Ala Asp Gln His Val
        435   440   445

Gln Ala Tyr Leu Glu Ala Leu Pro Thr Glu Ala Glu Val Ala Asn Gln
        450   455   460

Trp Val Val Val Gln Pro Arg Arg Ser Asn His Asn Lys Lys Gln Met
465   470   475   480

Phe Asp Pro Lys Glu Leu Glu Lys Leu Asn Val Ser Asp Leu Glu Asp
              485   490   495

Lys Asp Ile Ser Arg Val Asp Ala Thr Ala Thr Gly Ile Val Ala Ser
        500   505   510

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Gly Ser Gln Gly Ser Ser Asn Leu Leu Gly Ala Ser Ser Asp Gly Leu
    515   520   525

Leu Gln Glu Leu Glu Lys Ser Ser Ser Thr Arg Gly Gly Pro Lys Gln
    530   535   540

Val Thr Thr Lys Ser Ser Ser His Tyr Leu Gly Lys Ile Arg Glu Lys
545   550   555   560

Ser Ile Ser Gly Leu Pro Glu Phe Asn Glu Ser Thr Ser Ile Glu Ser
            565   570   575

Gly Gly Leu Pro Gln Ser Ile Gln Glu His Ser Ser Arg Arg Thr Ser
            580   585   590

Ala Arg Arg Glu Pro Val Lys Phe Gly Arg Leu Ile Leu Ile Ala Ile
        595   600   605

Val Gly Phe Leu Leu Ile Gly Phe Ile Gly Leu Leu Thr Ile Lys Thr
        610   615   620

Ile Gly Trp Leu Val Asn Ala Leu Gly Trp Glu Arg Glu Lys Leu Met
625   630   635   640

Ile Gln Leu Asp Arg Pro Pro Ile Glu Ile Pro Glu Pro Asp Arg Val
            645   650   655

Asn Leu Ala Ala Ser Gly Pro Ile Thr Lys Glu Val Ala Arg Arg Thr
            660   665   670

Ile Gln Ser Trp Leu Asp Ile Lys Ala Ser Ala Leu Gly Pro Asn His
            675   680   685

Lys Ile Glu Gln Leu Pro Asn Ile Leu Val Glu Pro Ala Leu Ser Arg
        690   695   700

Trp Leu Pro Thr Ala Asn Ala Leu Lys Gln Glu Lys Ser Tyr Arg Arg
705   710   715   720

-220-

Tyr Glu His Asp Leu Glu Ile Ser Asn Ile Lys Met Ser Asn Thr Asn
              725   730   735

Ser Asn Leu Ala Gln Val Asp Ala Lys Val Ile Glu Lys Val Glu Phe
              740   745   750

Tyr Ser Asp Asn Gly Arg Leu Thr Asn Thr Asn Asn Glu Asn Leu Phe
              755   760   765

Val Arg Tyr Asp Leu Val Arg Lys Ser Gln Lys Trp Gln Ile Ser Asn
    770   775   780

Trp Lys Val Leu Arg
785

<210>   195
<211>   765
<212>   PRT
<213>   Homo sapiens

<400>   195

Met Gly Asn Arg Gly Met Glu Asp Leu Ile Pro Leu Val Asn Arg Leu
1   5   10   15

Gln Asp Ala Phe Ser Ala Ile Gly Gln Asn Ala Asp Leu Asp Leu Pro
              20   25   30

Gln Ile Ala Val Val Gly Gly Gln Ser Ala Gly Lys Ser Ser Val Leu
              35   40   45

Glu Asn Phe Val Gly Arg Val Thr Arg Arg Pro Leu Val Leu Gln Leu
    50   55   60

Val Asn Ala Thr Thr Glu Tyr Ala Glu Phe Leu His Cys Lys Gly Lys
65   70   75   80

Lys Phe Thr Glu Ala Glu Thr Asp Arg Val Thr Gly Thr Asn Lys Gly
              85   90   95

Ile Ser Pro Val Pro Ile Asn Leu Arg Val Tyr Ser Pro His Val Leu
              100   105   110

Asn Leu Thr Leu Val Asp Leu Pro Gly Met Thr Lys Val Pro Val Gly
              115   120   125

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```
Asp Gln Pro Pro Asp Ile Glu Phe Gln Ile Arg Asp Met Leu Met Gln
    130             135             140
```

```
Phe Val Thr Lys Glu Asn Cys Ser Asp Leu Ala Asn Ser Asp Ala Leu
145             150             155             160
```

```
Lys Val Ala Lys Glu Val Asp Pro Gln Gly Gln Arg Thr Ile Gly Val
            165             170             175
```

```
Ile Thr Lys Leu Asp Leu Met Asp Glu Gly Thr Asp Ala Arg Asp Val
        180             185             190
```

```
Leu Glu Asn Lys Leu Leu Pro Leu Arg Arg Gly Tyr Ile Gly Val Val
        195             200             205
```

```
Asn Arg Ser Gln Lys Asp Ile Asp Gly Lys Lys Asp Ile Thr Phe Leu
    210             215             220
```

```
Ser His Pro Ser Tyr Arg His Leu Ala Asp Arg Met Gly Thr Pro Tyr
225             230             235             240
```

```
Leu Gln Lys Val Leu Asn Gln Gln Leu Thr Asn His Ile Arg Asp Thr
            245             250             255
```

```
Leu Pro Gly Leu Arg Asn Lys Leu Gln Ser Gln Leu Leu Ser Ile Glu
            260             265             270
```

```
Lys Glu Val Glu Glu Tyr Lys Asn Phe Arg Pro Asp Asp Pro Ala Arg
        275             280             285
```

```
Lys Thr Lys Ala Leu Asp Phe Glu Lys Arg Ile Glu Gly Ser Gly Asp
        290             295             300
```

```
Gln Ile Asp Thr Tyr Glu Leu Ser Gly Gly Ala Arg Ile Asn Arg Ile
305             310             315             320
```

```
Phe His Glu Arg Phe Pro Phe Glu Leu Val Lys Met Glu Phe Asp Glu
            325             330             335
```

```
Lys Glu Leu Arg Arg Glu Ile Ser Tyr Ala Ile Lys Asn Ile His Gly
            340             345             350
```

Ile Arg Thr Gly Leu Phe Thr Pro Asp Met Ala Lys Lys Ile Arg Glu
        355   360   365

Pro Cys Leu Lys Cys Val Asp Met Val Ile Ser Glu Leu Ile Ser Thr
        370   375   380

Val Arg Gln Cys Thr Lys Lys Leu Gln Gln Tyr Pro Arg Leu Arg Glu
385   390   395   400

Glu Met Glu Arg Ile Val Thr Thr His Ile Arg Glu Arg Glu Gly Arg
                405   410   415

Thr Lys Glu Gln Val Met Met Asn Thr Asn His Glu Asp Phe Ile Gly
                420   425   430

Phe Ala Asn Ala Gln Gln Arg Ser Asn Gln Met Asn Lys Lys Lys Thr
                435   440   445

Ser Gly Asn Gln Asp Glu Ile Leu Val Ile Arg Lys Gly Trp Leu Thr
        450   455   460

Ile Asn Asn Ile Gly Ile Met Lys Gly Gly Ser Lys Glu Tyr Trp Phe
465   470   475   480

Val Leu Thr Ala Glu Asn Leu Ser Trp Tyr Lys Asp Asp Ser Val Asp
                485   490   495

Asn Leu Lys Leu Arg Asp Val Glu Lys Gly Phe Met Ser Ser Lys His
                500   505   510

Ile Phe Ala Leu Phe Asn Thr Glu Gln Arg Asn Val Tyr Lys Asp Tyr
        515   520   525

Arg Gln Leu Glu Leu Ala Cys Glu Thr Gln Glu Glu Val Asp Ser Trp
        530   535   540

Lys Ala Ser Phe Leu Arg Ala Gly Val Tyr Pro Glu Arg Val Gly Asp
545   550   555   560

Lys Glu Lys Asp Ser Phe Met His Ser Met Asp Pro Gln Leu Glu Arg
                565   570   575

Gln Val Glu Thr Ile Arg Asn Leu Val Asp Ser Tyr Met Ala Ile Val
                580   585   590

```
Asn Lys Thr Val Arg Asp Leu Met Pro Lys Thr Ile Met His Leu Met
    595             600             605

Ile Asn Asn Thr Lys Glu Phe Ile Phe Ser Glu Leu Leu Ala Asn Leu
    610             615             620

Tyr Ser Cys Gly Asp Gln Asn Thr Leu Met Arg Asp Glu Met Leu Arg
625             630             635             640

Met Tyr His Ala Leu Lys Glu Ala Leu Ser Ile Ile Gly Asn Ile Asn
            645             650             655

Thr Thr Thr Val Ser Thr Pro Met Pro Pro Val Asp Asp Ser Trp
            660             665             670

Leu Gln Val Gln Ser Val Pro Ala Gly Arg Arg Ser Pro Thr Ser Ser
        675             680             685

Pro Thr Pro Gln Arg Arg Ala Pro Ala Val Pro Pro Ala Arg Pro Gly
    690             695             700

Ser Ala Gly Ser Ala Leu Gly Gly Ala Pro Pro Val Pro Ser Arg Pro
705             710             715             720

Gly Ala Ser Pro Asp Pro Phe Gly Pro Pro Gln Val Pro Ser Arg
            725             730             735

Pro Asn Arg Ala Pro Pro Gly Val Pro Ser Arg Ser Gly Gln Ala Ser
            740             745             750

Pro Ser Arg Pro Glu Ser Pro Arg Pro Pro Phe Asp Leu
        755             760             765

<210>  196
<211>  670
<212>  PRT
<213>  Saccharomyces cerevisiae

<400>  196

Met Ala Ser Leu Glu Asp Leu Ile Pro Thr Val Asn Lys Leu Gln Asp
1               5               10              15

Val Met Tyr Asp Ser Gly Ile Asp Thr Leu Asp Leu Pro Ile Leu Ala
            20              25              30
```

Val Val Gly Ser Gln Ser Ser Gly Lys Ser Ser Ile Leu Glu Thr Leu
        35   40   45

Val Gly Arg Val Thr Arg Arg Pro Leu Val Leu Gln Leu Asn Asn Ile
    50   55   60

Ser Pro Asn Ser Pro Leu Ile Glu Glu Asp Asp Asn Ser Val Asn Pro
65   70   75   80

His Asp Glu Val Thr Lys Ile Ser Gly Phe Glu Ala Gly Thr Lys Pro
            85   90   95

Leu Glu Tyr Arg Gly Lys Glu Arg Asn His Ala Asp Glu Trp Gly Glu
            100   105   110

Phe Leu His Ile Pro Gly Lys Arg Phe Tyr Glu Asn Glu Thr Ala Arg
        115   120   125

Ile Ala Gly Lys Asp Lys Gly Ile Ser Lys Ile Pro Ile Asn Leu Lys
    130   135   140

Val Phe Ser Pro His Val Leu Asn Leu Thr Leu Val Asp Leu Pro Gly
145   150   155   160

Ile Thr Lys Val Pro Ile Gly Glu Gln Pro Pro Asp Ile Glu Lys Gln
            165   170   175

Ile Lys Asn Leu Ile Leu Asp Tyr Ile Ala Thr Pro Asn Cys Val Asp
            180   185   190

Leu Val Asn Ser Glu Ser Leu Lys Leu Ala Arg Glu Val Asp Pro Gln
        195   200   205

Gly Lys Arg Thr Ile Gly Val Ile Thr Lys Leu Asp Leu Met Asp Ser
    210   215   220

Gly Thr Asn Ala Leu Asp Ile Leu Ser Gly Lys Met Tyr Pro Leu Lys
225   230   235   240

Leu Gly Phe Val Gly Val Val Asn Arg Ser Gln Gln Asp Ile Gln Leu
            245   250   255

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```
Asn Lys Thr Val Glu Phe Arg Lys His Pro Val Tyr Arg Thr Ile Ser
            260             265             270

Thr Lys Cys Gly Thr Arg Tyr Leu Ala Lys Leu Leu Asn Gln Thr Leu
            275             280             285

Leu Ser His Ile Arg Asp Lys Leu Pro Asp Ile Lys Thr Lys Leu Asn
    290             295             300

Thr Leu Ile Ser Gln Thr Glu Gln Glu Leu Ala Arg Tyr Gly Gly Val
305             310             315             320

Gly Ala Thr Thr Asn Glu Ser Arg Ala Ser Leu Val Asn Phe Ile Ser
            325             330             335

Ser Ile Asp Gly Thr Ser Ser Asp Ile Asn Thr Lys Glu Leu Cys Gly
            340             345             350

Gly Ala Arg Ile Tyr Tyr Ile Tyr Asn Asn Val Phe Gly Asn Ser Leu
            355             360             365

Lys Ser Ile Asp Pro Thr Ser Asn Leu Ser Val Leu Asp Val Arg Thr
    370             375             380

Ala Ile Arg Asn Ser Thr Gly Pro Arg Pro Thr Leu Phe Val Pro Glu
385             390             395             400

Leu Ala Lys Leu Leu Leu Glu Pro Ser Gln Arg Cys Val Glu Leu Val
            405             410             415

Tyr Glu Glu Leu Met Lys Ile Cys His Lys Cys Gly Ser Ala Glu Leu
            420             425             430

Ala Arg Tyr Pro Lys Leu Lys Ser Met Leu Ile Glu Val Ile Ser Glu
            435             440             445

Leu Leu Arg Glu Arg Leu Gln Pro Thr Arg Ser Tyr Val Glu Ile Asn
    450             455             460

Thr Asn His Pro Asn Phe Leu Ser Ala Thr Glu Ala Met Asp Asp Ile
465             470             475             480

Met Lys Thr Arg Arg Lys Arg Asn Gln Glu Leu Leu Lys Ser Lys Leu
            485             490             495
```

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```
Ser Gln Gln Glu Asn Gly Gln Thr Asn Gly Ile Asn Gly Thr Ser Ser
        500                 505                 510

Ile Ser Ser Asn Ile Asp Gln Asp Asp Gly Ile Asp Ala Glu Ser Lys
        515                 520                 525

Gln Thr Lys Asp Lys Phe Leu Asn Tyr Phe Phe Gly Lys Asp Lys Lys
        530                 535                 540

Gly Gln Pro Val Phe Asp Ala Ser Asp Lys Lys Arg Ser Ile Ala Gly
545                 550                 555                 560

Asp Gly Asn Ile Glu Asp Phe Arg Asn Leu Gln Ile Ser Asp Phe Ser
                565                 570                 575

Leu Gly Asp Ile Asp Asp Pro Leu Thr Glu Arg Glu Glu Leu Glu Cys
            580                 585                 590

Glu Leu Ile Lys Arg Leu Ile Val Ser Tyr Phe Asp Ile Ile Arg Glu
        595                 600                 605

Met Ile Glu Asp Gln Val Pro Lys Ala Val Met Cys Leu Leu Val Asn
    610                 615                 620

Tyr Cys Lys Asp Ser Val Gln Asn Arg Leu Val Thr Lys Leu Tyr Lys
625                 630                 635                 640

Glu Thr Leu Phe Glu Glu Leu Leu Arg Glu Leu Cys Val Lys Ser Leu
            645                 650                 655

Gly Val Tyr Lys Lys Ala Ala Thr Leu Ile Ser Asn Ile Leu
        660                 665                 670


<210>  197
<211>  690
<212>  PRT
<213>  Arabidopsis thaliana

<400>  197

Met Ala Glu Val Ser Ala Lys Ser Val Thr Val Glu Glu Met Ala Glu
1               5                   10                  15

Glu Asp Asp Ala Ala Ile Glu Glu Arg Trp Ser Leu Tyr Glu Ala Tyr
            20                  25                  30
```

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```
Asn Glu Leu His Ala Leu Ala Gln Glu Leu Glu Thr Pro Phe Glu Ala
        35              40                  45

Pro Ala Val Leu Val Val Gly Gln Gln Thr Asp Gly Lys Ser Ala Leu
        50              55                  60

Val Glu Ala Leu Met Gly Phe Lys Thr Arg Arg Pro Ile Thr Leu His
65              70              75                      80

Met Lys Tyr Asp Pro Gln Cys Gln Phe Pro Leu Cys His Leu Gly Ser
            85              90                  95

Asp Asp Asp Pro Ser Val Ser Leu Pro Lys Glu Ala Glu Asn Met Arg
            100             105                 110

Leu Glu Gln Glu Pro Cys Ser Pro Phe Ser Ala Lys Glu Ile Ile Val
        115             120                 125

Lys Val Gln Tyr Lys Tyr Cys Pro Asn Leu Thr Ile Ile Asp Thr Pro
        130             135                 140

Gly Leu Ile Ala Pro Ala Pro Gly Leu Lys Asn Arg Ala Leu Gln Val
145             150             155                     160

Gln Ala Arg Ala Val Glu Ala Leu Val Arg Ala Lys Met Gln His Lys
            165             170                 175

Glu Ser Asp Trp Ser Ile Ala Thr Thr Arg Arg Ile Val Met Gln Val
            180             185                 190

Asp Pro Glu Leu Ser Arg Thr Ile Val Val Ser Thr Lys Leu Asp Thr
        195             200                 205

Lys Ile Pro Gln Phe Ser Cys Ser Ser Asp Val Glu Val Phe Leu Ser
        210             215                 220

Pro Pro Ala Ser Ala Leu Asp Ser Ser Leu Leu Gly Asp Ser Pro Phe
225             230                 235                     240

Phe Tyr Gly Gln Asp Ser Val Tyr Lys Ser Asn Asp Glu Phe Lys Gln
            245             250                 255
```

-228-

```
Ala Val Ser Leu Arg Glu Met Glu Asp Ile Ala Ser Leu Glu Lys Lys
        260             265             270

Leu Gly Arg Leu Leu Thr Lys Gln Glu Lys Ser Arg Ile Gly Ile Ser
        275             280             285

Lys Leu Arg Leu Phe Leu Glu Glu Leu Leu Trp Lys Arg Tyr Lys Glu
    290             295             300

Ser Val Pro Leu Ile Ile Pro Leu Arg Lys Leu Asp Thr Val Ser Lys
305             310             315             320

Glu Leu Ser Ser Leu Asp Glu Ala Lys Leu Lys Glu Arg Gly Arg Thr
            325             330             335

Phe His Asp Leu Phe Leu Thr Lys Leu Ser Leu Leu Leu Lys Gly Thr
            340             345             350

Val Val Ala Pro Pro Asp Lys Phe Gly Glu Thr Leu Gln Asp Glu Arg
        355             360             365

Thr Gln Gly Gly Ala Phe Val Gly Thr Asp Gly Leu Gln Phe Ser Arg
    370             375             380

Leu Tyr Gly Gly Ala Gln Tyr His Arg Ala Met Ala Glu Phe Arg Phe
385             390             395             400

Leu Val Gly Ala Ile Lys Cys Pro Pro Ile Thr Arg Glu Glu Ile Val
            405             410             415

Asn Ala Cys Gly Val Glu Asp Ile His Asp Gly Thr Asn Tyr Ser Arg
            420             425             430

Thr Ala Cys Val Ile Ala Val Ala Lys Ala Arg Glu Thr Phe Glu Pro
            435             440             445

Phe Leu His Gln Leu Gly Leu Leu Pro Ile Ser Val Tyr Leu Leu Gln
    450             455             460

Lys Glu Gly Glu Tyr Leu Ser Gly His Glu Val Phe Leu Lys Arg Val
465             470             475             480

Ala Ser Ala Phe Asn Ser Phe Val Glu Ser Thr Glu Lys Ser Cys Arg
            485             490             495
```

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```
Asp Lys Cys Met Glu Asp Leu Ala Ser Thr Thr Arg Tyr Val Thr Trp
        500             505             510

Ser Leu His Asn Lys Asn Ser Phe Gly Gly Thr Glu His Asn Thr Thr
        515             520             525

Ser Gly Asn Ala Ile Gly Phe Ser Leu Pro Gln Asp Ala Leu Gly Gly
        530             535             540

Thr Thr Asp Thr Lys Ser Arg Ser Asp Val Lys Leu Ser His Leu Ala
545             550             555             560

Ser Asn Ile Asp Ser Gly Ser Ser Ile Gln Thr Thr Glu Met Arg Leu
                565             570             575

Ala Asp Leu Leu Asp Ser Thr Leu Trp Asn Arg Lys Leu Ile Val Tyr
        580             585             590

Ala Leu Val Gln Gln Ile Phe Gln Gly Ile Arg Glu Tyr Phe Leu Ala
        595             600             605

Ser Ala Glu Leu Lys Phe Asn Cys Phe Leu Leu Met Pro Ile Val Asp
    610             615             620

Lys Leu Pro Ala Leu Leu Arg Glu Glu Leu Glu Asn Ala Phe Glu Asp
625             630             635             640

Asp Leu Asp Ser Ile Phe Asp Ile Thr Asn Leu Arg Thr Glu Ile Glu
            645             650             655

Leu Arg Arg Val Lys Arg Ile Lys Glu Lys Phe Arg Val Met Asn Glu
            660             665             670

Lys Leu Asn Ser His Glu Phe Ala Gln Asn Leu Lys Ala Pro Ser Val
        675             680             685

Gln His
690
```

-230-

<210> 198
<211> 712
<212> DNA
<213> Lactuca sativa

<220>
<221> misc_feature
<222> (608)..(608)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (656)..(656)
<223> n is a, c, g, or t

<400> 198

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ttgttcagct ccgccaaaag aatccaagaa ttggcgtaat ccggctcgat tcttattgtg      60

aagggaccag gtgacataac gggtggtgct tattagatct tccatgcatt tttcatggca     120

tgatctttcg gtggattcag caaagttata gaaagcagat gaaacacgtc tcaagaaaac     180

ttcatggcca cttaggaatt cgccttcttt ctgaagaaga taaacggaga tgggaagtaa     240

tctcttgaga atgtgaagaa gtcgactgcc caactgatga agaaaaggtt caaaagtatc     300

acgagctttt gcaacagcga tgacacatgc agtcctggag taatttgttc catcatgaat     360

atcttcgacc ccacatgcat tcacaatttc ttcacgtgta attgcagggc attttatccc     420

tccaacaaca aacctaaatt cagccatggc acgatgatat tgtgcacctc catatagacg     480

catacctgca ttaggtatta gtttgtgtgg gaactgagag ccatcaatac cgattaatgc     540

ccctccatta accctctcat cttgtagtgt ttccccaaat ttatctggag gtgcaacaac     600

tgtccctntt catagcagtg ataacttggt aaggaaaaga tcatgaaaag atctcncttt     660

ctcctttagt ttgacttcat ctaaagtgct gagttcttga tttatgtcat tt            712
```

<210> 199
<211> 666
<212> DNA
<213> Medicago truncatula

<220>
<221> misc_feature
<222> (646)..(646)
<223> n is a, c, g, or t

<400> 199

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atctaaagta acaaccacca caaaacacaa caatggagga agaaagagaa caccaccaac      60

tcaaagacaa agaagaaaac gagtggcgtc tctacgaagc ttacaatgaa cttcacgcgc     120
```

```
ttgctcaaga acttcacacg cctttcgacg cgccggcggt actggttgtg ggccaccaaa      180

cagacgggaa gagcgcctta gttgaggctc taatgggctt ccagttcaac cacgtcggtg      240

gtggcaccaa aacccgccgg cccattactc ttcacatgaa atatggccca cattgcgagt      300

ctccttcttg ctatcttctt tctgatgatg acccttctct ttctcaccat atgtcacttt      360

cccaaatcca gggttatatt gaagctgaga atgcgaggtt ggagcgtgac tcatgttgtc      420

aattttcagc taaggaaata atcataaaag tggaatacaa atactgtccc aatctcacca      480

taatagacac accaggatta gttgctcctg caccaggtcg taaaaatagg gcgatacagg      540

cacaggcacg agcggtagag tcactcgttc gtgcaaaaat gcagcacaag gagttcatta      600

tactctgtct tgaagattgt agtgattgga gcaatgcgac tacgangcgc gttgtaatgc      660

aaattg                                                                 666


<210>  200
<211>  663
<212>  DNA
<213>  Medicago truncatula

<400>  200
gtctttatgg gggtgcacaa tatcatcgag caatggctga atttcgtttt gtagttggag       60

gaatcaagtg ccctccaatt acccgggaag aaattgtaaa tgcttgtgga gttgaagaca      120

ttcatgatgg aacaaactac tctaggactg cttgtgtaat tgctgttgca aaggctcatg      180

atacatttga accttttctt catcagttgg ggtctagatt gttgcacata cttaagagat      240

tgctcccaat ctctttttat cttcttcaga aagattgtga gtatctaagt ggccatcagg      300

tgttcctcag gcgtgttgcc tccgccttcg acaactttgc agaatccact gaaaaatcat      360

gccgtgaaaa atgtatggag gacttggtaa gcaccacacg atatgtctca tggtctctac      420

acaataagag tcgggcagga ttacgccagt tcttagattc atttggtgga acagaacatt      480

ccaatgtttg taatgatccc actgcaactg ttctatcaca aacaaatgtg caagagaagg      540

aagacacaaa gccacaacta gaagtaaagc tcagtcacgt ggcctctgga actgatccta      600

gcacatccac ccagacagct gaaacaaagc ttgctgacct tcttgatagt acactttgga      660

atc                                                                    663
```

-232-

```
<210>   201
<211>   622
<212>   DNA
<213>   Prunus persica


<220>
<221>   misc_feature
<222>   (609)..(609)
<223>   n is a, c, g, or t

<400>   201
gcttatacct aacgcaggaa tgcgtttata tggtggtgca caataccacc gtgccatggc        60

tgagttccgc tttgtagttg gaggaataaa atgccctcca attacaaggg aagaaattgt       120

aaatgcatgt ggagttgaag atttacatga tggcacaaac tactcaagga cagcttgtgt       180

aatagccgtt gcaaaggccc gtgatacatt tgagcctttc cttcatcagt taggttgtag       240

actcttgcac attctaaaga gattacttcc tatatcagtc tatcttcttc agaaagatgg       300

tgagtattta agtggccatg aggtgtttct taggcgtgtt gcttctgctt tcaatgactt       360

tgcagaatct accgaaaggg catgtcgtga aaaatgcatg gaggatttag taagcaccac       420

ccgctatgtc acctggtccc ttcacaacaa gaatcgagct gggttacgtc aatttttaga       480

ctcgttcgct ggaacagaac ataacactat gggtagtaat tgcgtacctg ctggtatttc       540

ccaagattca tcctttgggt ctgttgccaa tgagaaggat actaagtcaa gggcagatgt       600

gaagctcanc catgtggcgt ct                                                622


<210>   202
<211>   752
<212>   DNA
<213>   Solanum tuberosum

<400>   202
gcgaatgtga ttcttcaaag gcaacaaagg ctgacggagg aatttgtgcc tcgtgcagat        60

ctgcttctgt ttctcatgtc tgctgatcga ccattaactg aaagtgaggt tagttttctg       120

cgttacactc agcagtggag taagaaggtc atttttgtgc tgaacaagtc tgacatatac       180

aagaataacg gcgagttgga ggaggccatt gcatttatca aagaaaatac acggaaattg       240

ctgaatacag aatccgtaac actgtatcca gtatctgcac ggctcgctct tgaatcaaag       300

ctttctactt ttgatggtgc ccttagtcaa aacaatggga gttcaaataa tgattctcac       360

tggaaaacca agagcttcta tgagcttgag aagtacttgt ctagcttttt ggattcatcc       420

acaagtactg gaattgagag aatgaagctg aagcttgaaa ctccaattgc cattgcagaa       480
```

-233-

```
caactacttt tagcttgtca aggacttgtg agacaagaat gtcagcaagc caaacaagac      540

ttgctgtttg ttgaggatct tgtcaacagc gtagaagagt gcacaaagaa gctggaagtt      600

gatagcattc tgtggaagag gcaggttcta tctctgataa actctgctca agcacgtgtt      660

gtccggcttg tagagtcaac gttacaactg tcaaatgttg atcttgtcgc tacatatgta      720

ttcagaagag aaaactctac tcaaatgcca gc                                    752


<210>   203
<211>   492
<212>   DNA
<213>   Glycine max

<400>   203
tgttgaatga agctattgaa gctatcaaga gggctgcacc tctgatggag gaggtttcac       60

ttcttaatga tgcggtttct caaattgatg agccattctt actggttata gtgggggaat      120

tcaactctgg taaatctacc gtgattaatg cgcttcttgg agaaagatat ctcaaagagg      180

gagttgttcc aacaactaat gagatcacat ttttacgata tactgactta gatattgaac      240

aacaacggtg tgaaaggcat ccagatggcc aatatatttg ctacattcct gctccaattc      300

ttaaagagat gaccattgtt gatacacctg gaactaatgt gattcttcag aggcagcagc      360

gtcttacaga ggaatttgta ccccgtgcag atttacttct ttttgtcatt tctgctgatc      420

gccctttaac tggaagtgag attgcttttc ttcgttattc tcagcagtgg aaaaagaaag      480

cggtctttgt ct                                                         492


<210>   204
<211>   446
<212>   DNA
<213>   Lycopersicon esculentum

<400>   204
gagaccatta agtacaattc tataagcagt cttttgaaaa aagatggact tcattggtga       60

atccgtctga ccaaattgag ttaggaacaa ctggtgtgct ggatagaaaa tctgaagtta      120

ccataagtgt catagaggat ttcagtgctg cagctgcttc aaaattgctt gagagagata      180

ttcgtgaagt gttcttgggt acttttggtg gtcttggagc agctggttta tcagcgtcgc      240

ttctgacatc tgttcttcaa accacattag aagacctcct tgcacttggc ctttgttctg      300

ctggcgggtt attagcggtc ttcaacttct catcccggag acagcaagtg gtagataaag      360

taaagaggac tgctgatggc ctttcacgtg aactcgaaga ggctatgcag aaggagctct      420

tggagacgac tagtaatgtg gaggac                                          446
```

-234-

<210> 205
<211> 521
<212> DNA
<213> Populus balsamifera subsp. trichocarpa

<400> 205
tggtgttgtg ctgtctgatc aagggcttcc tgcccttgtg gcaagaaata tgatgatggg   60

ttctcgaact gaatcagttg ttctaccttt ggtagccagg attgtgcaga caccatatgc   120

tgcattaaat gcgtctaatt ctgaaggtgc tgattttctt atatatgttc atggcccaga   180

ggatgatcct gatgtagaaa tgagccctgg attcgggaat gtgaagatac caatctttgt   240

cctcaatgct tcacgtgggg aggacacatt gtcggtgggg gcatcaaaat ttctgaaaac   300

cggtgctagt ggtttagttc tgtcattgga agatttgagg ttatttagcg atgatgcttt   360

gagtcagatg tttgacactc tgagtgcaac cggtaaaaac tttcaggatg accttgaaag   420

cttcagtaag ctcaaatcta tggatatgga aaatgatatt catgaaaaaa caacggtggc   480

aggctttgtt aaactggagg atagagaaaa acagctcata g   521

<210> 206
<211> 324
<212> PRT
<213> Arabidopsis thaliana

<400> 206

Met Glu Ala Leu Ser His Val Gly Ile Gly Leu Ser Pro Phe Gln Leu
1   5   10   15

Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His Asn Thr
            20   25   30

Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser
            35   40   45

Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Phe Ala Thr Ala
        50   55   60

Thr Thr Thr Ala Thr Leu Val Ser Leu Pro Pro Ser Ile Asp Arg Pro
65   70   75   80

Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala
                85   90   95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg
                100   105   110

-235-

```
Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser
        115         120             125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg
        130         135             140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr
145             150             155             160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val
            165             170             175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala
        180             185             190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu
        195             200             205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu
    210             215             220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu
225             230             235             240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg
            245             250             255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu
            260             265             270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu
        275             280             285

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly
    290             295             300

Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe Met Asn
305                 310             315             320

Glu Ala Phe Leu
```

```
<210>  207
<211>  8
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic


<220>
<221>  misc_feature
<222>  (2)..(3)
<223>  Xaa can be any naturally occurring amino acid

<220>
<221>  misc_feature
<222>  (5)..(5)
<223>  Xaa can be any naturally occurring amino acid

<220>
<221>  misc_feature
<222>  (7)..(7)
<223>  Xaa can be any naturally occurring amino acid

<400>  207

Cys Xaa Xaa Cys Xaa Gly Xaa Gly
1               5


<210>  208
<211>  21
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Synthetic


<220>
<221>  CDS
<222>  (1)..(21)

<400>  208
gcg ttt tta tga atg aca gct                                21
Ala Phe Leu     Met Thr Ala
1               5
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